

# Facilitating Problem-Solving and Critical Thinking Using a Comprehensive Pedagogical Approach

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## Background and Significance

- ❖ Sharp contrast between clinical and theory pedagogy
- ❖ AACN call for change to nursing education
- ❖ Facilitate *Critical thinking/Problem-Solving*
- ❖ Incorporate situated cognition pedagogy
- ❖ Immerse in real-time health practice scenarios
- ❖ Scaffolding has shown to increase ability

## Purpose

- ❖ Comprehensive approach to facilitate *Critical Thinking and Problem-Solving*
- ❖ Effect of scaffolding on *Critical Thinking/Problem-Solving*
- ❖ Provide nursing faculty research based information

## Design and Methods

- ❖ Quasi-experimental, repeated measures design
- ❖ IRB-approved; obtained written informed consent
- ❖ Four real-life case scenarios solved over the semester
- ❖ Solved with scaffolding (question prompts, expert modeling, and group discussion) for Cases # 1 – 3 and without scaffolding for Case # 4
- ❖ Initial and revised solution reports after
- ❖ Evaluation of solution reports using modified Critical Thinking rubric (Ralston & Bays, 2010) and a modified Problem-Solving rubric (Tidwell, 2015)

## Research Questions

1. Over a semester in a course using a comprehensive approach using scaffolding are there differences in:
  - a) *Problem Solving* as a whole and its components?
  - b) *Critical Thinking* as a whole and its components?
2. To what extent does transfer of skill occur after using a comprehensive, scaffolding approach in:
  - a) *Problem Solving* as a whole and its components?
  - b) *Critical Thinking* as a whole and its components?

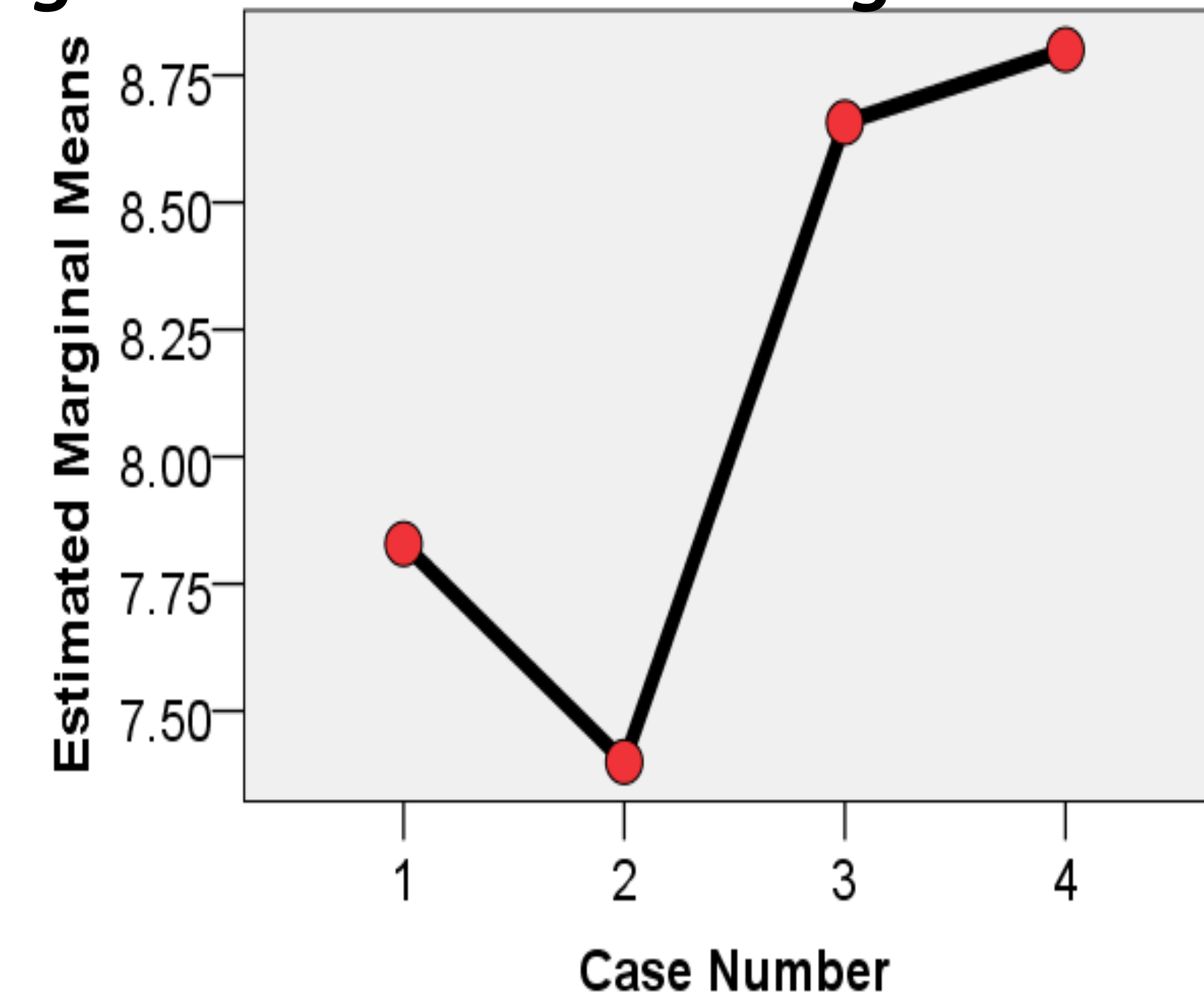
## Setting and Sample

- ❖ Final semester nursing leadership and management course in a prelicensure baccalaureate program
- ❖ Three class sections with different instructors
- ❖ All enrolled students consented (N=44)
- ❖ Missing data for Case #1 = 5 students; Cases # 2 and 3 = 1 student, Case #4 = 4 students

## Results

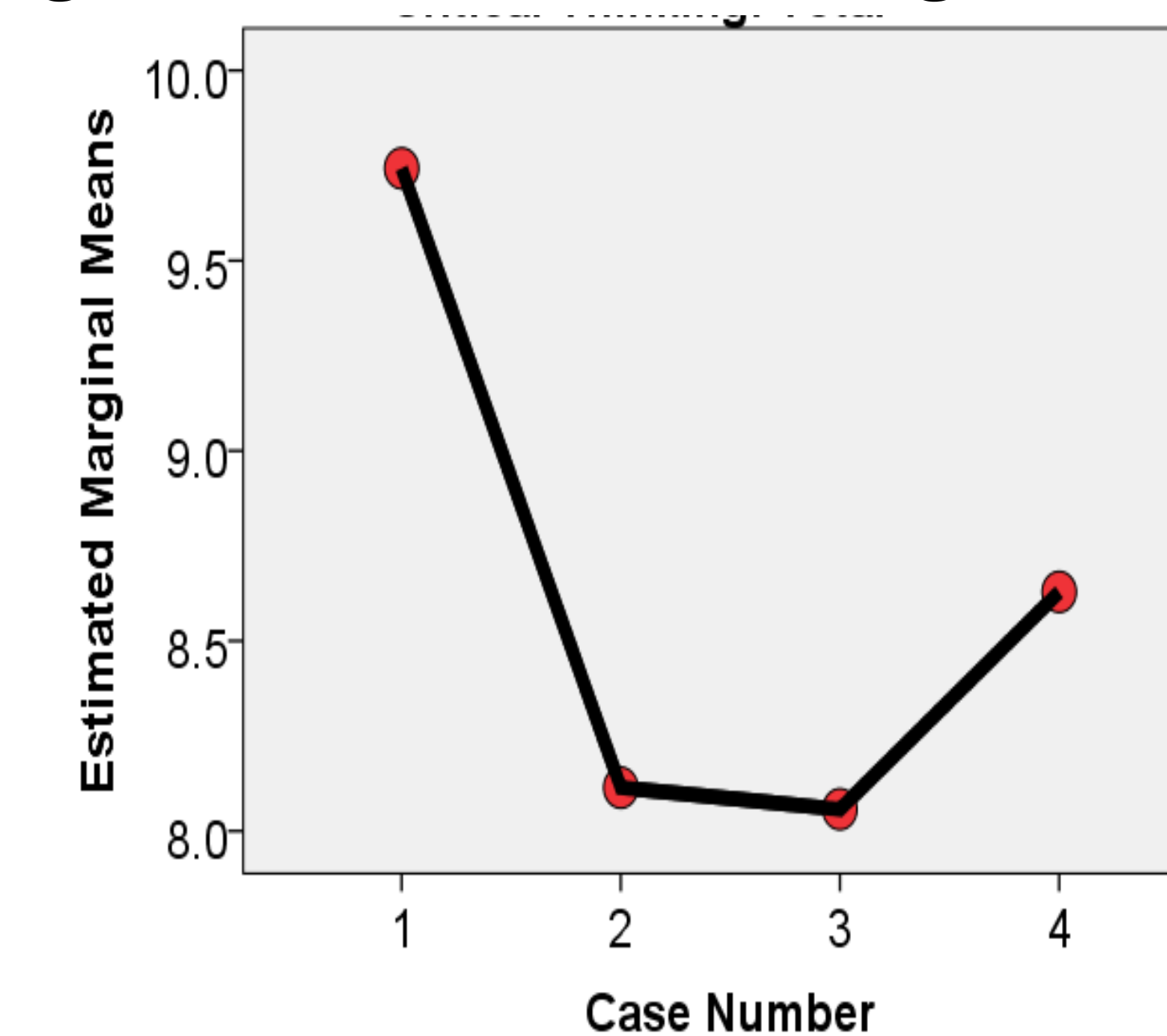
**QUESTION 1 a and b:** Case reports demonstrated significant mean differences on *Problem-Solving and Critical Thinking Total* scores and most of their rubric components

**Figure 1: Problem-Solving: Total score comparisons of 4 cases**



**Question #1a: Problem-Solving Total** means demonstrated a significant linear trend ( $F=7.01$ ,  $df=1,34$ ,  $p=.012$ ) with an increase of 1.0 points between the first and final cases (Figure 1)

**Figure 2: Critical Thinking: Total score comparisons of 4 cases**

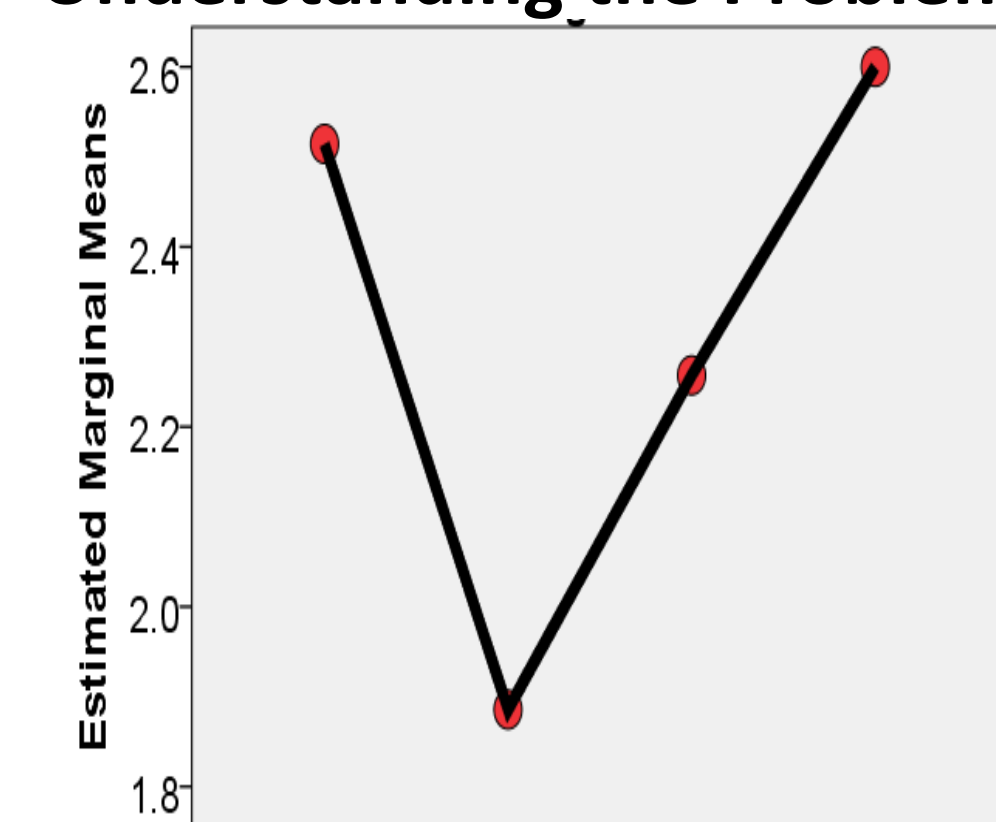


**Question #1b: Critical Thinking Total** means demonstrated a quadratic trend ( $F=9.12$ ,  $df=1,34$ ,  $p=.005$ ), reflecting the dip in Case 2 & 3 mean scores. (Figure 2)

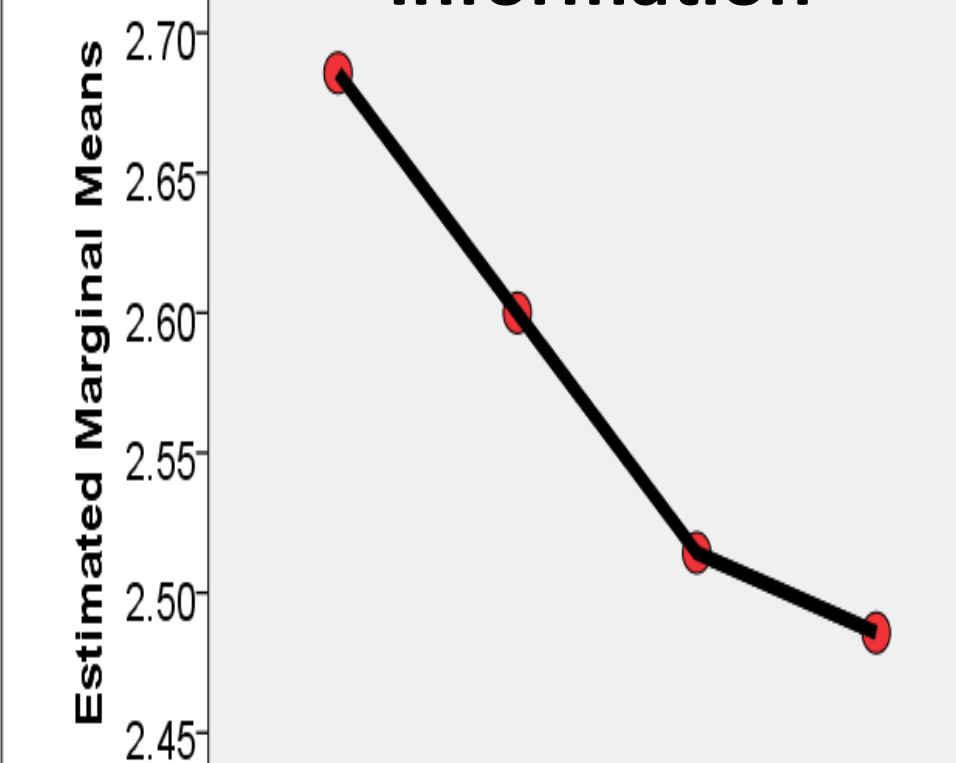
**Problem-Solving component comparisons between mean case scores**

- ❖ **Understanding the Problem:** quadratic trend ( $p=.031$ ) reflects a low Case #2 mean
- ❖ **Research & Gather Information:** no difference
- ❖ **Planning to Solve the Problem:** linear trend ( $p<.001$ ); .57 increase from 1<sup>st</sup> to last case mean
- ❖ **Problem Solution:** linear trend ( $p=.003$ ); .54 mean increase from 1<sup>st</sup> to last case

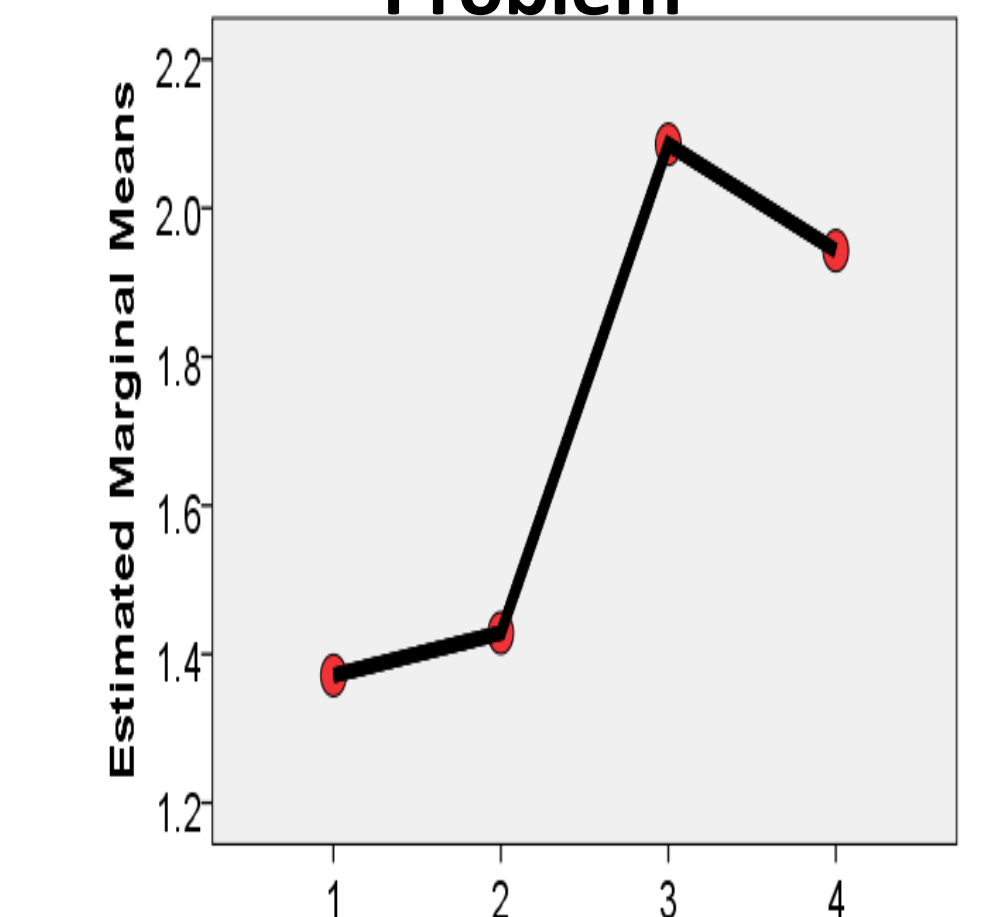
**Understanding the Problem**



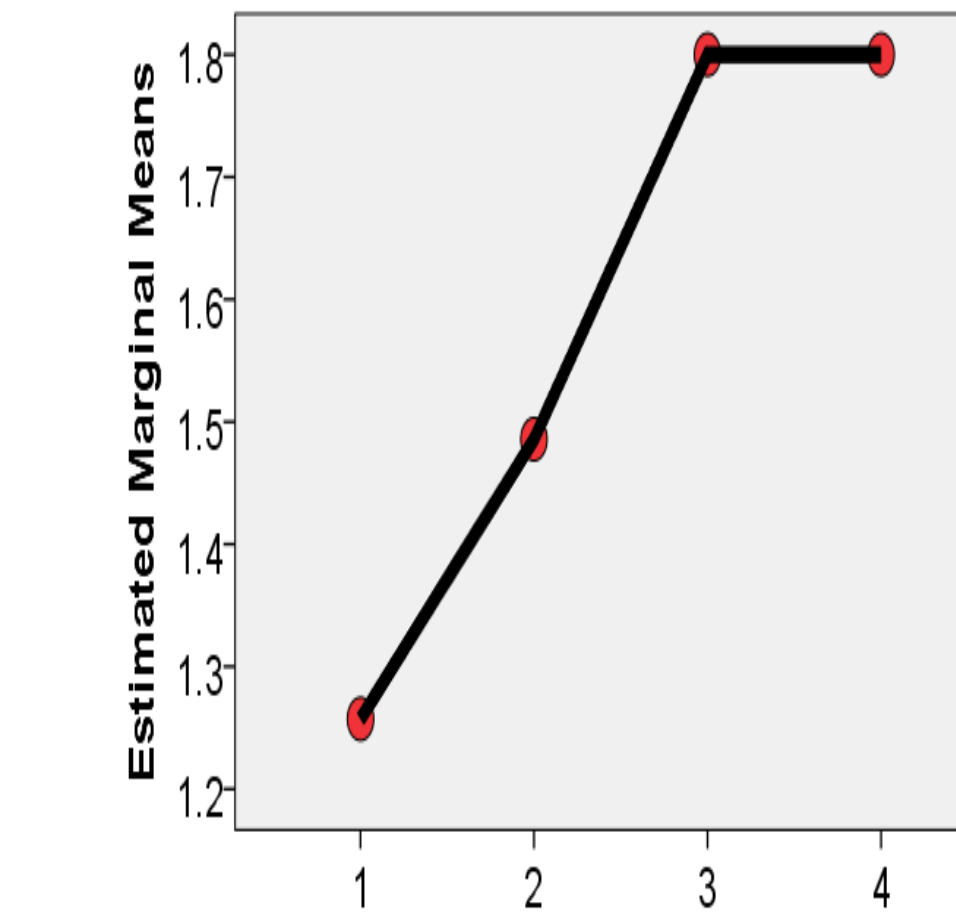
**Researching & Gathering Information**



**Planning to Solve the Problem**



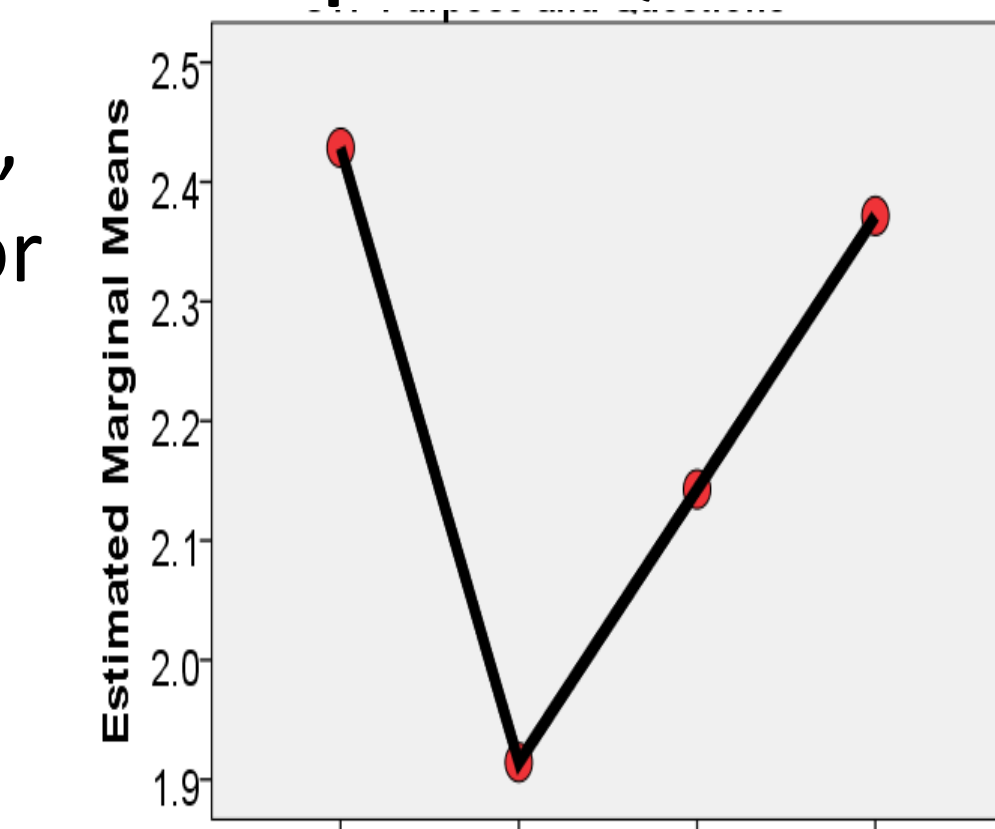
**Problem Solution**



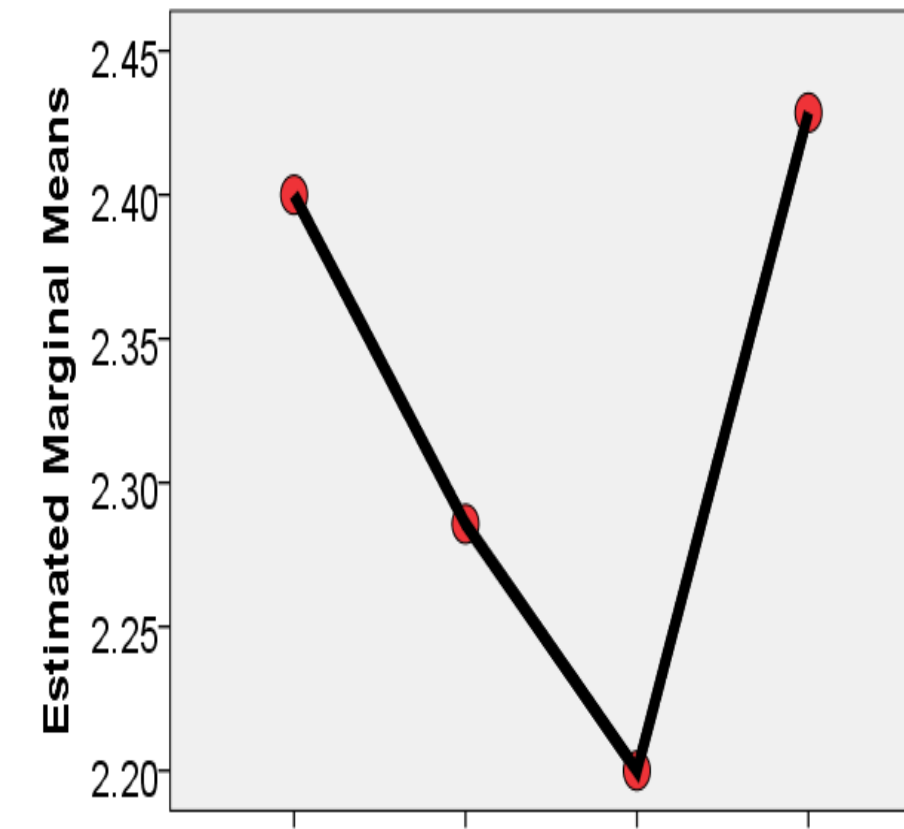
**Critical Thinking component comparisons between mean case scores**

- ❖ **Purpose & Questions:** quadratic trend ( $p=.007$ ), reflects a dip in scores for Cases 2 and 3
- ❖ **Information:** no difference
- ❖ **Assumptions and Viewpoints:** quadratic trend ( $p=.003$ ), reflects a dip in mean scores for Cases 2 and 3
- ❖ **Implications and Conclusions:** linear trend ( $p<.001$ ) with an overall mean decrease of 1.1 points between the 1<sup>st</sup> and final cases

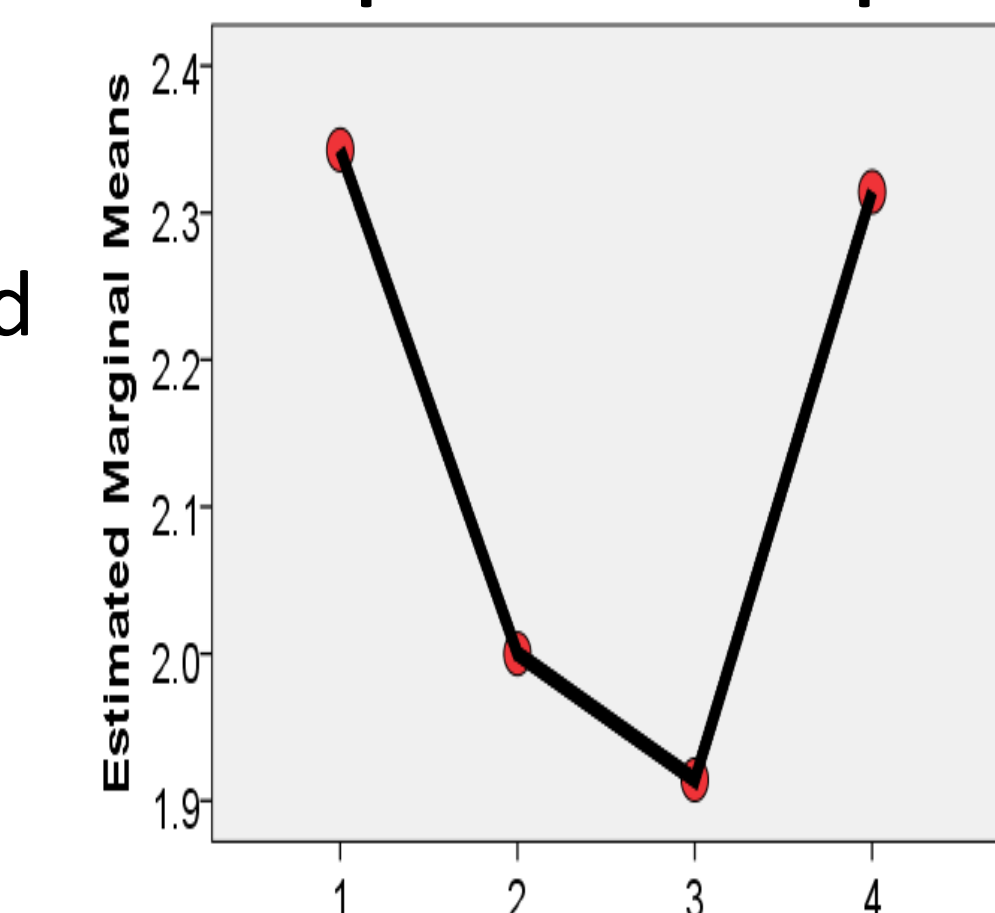
**Purpose & Questions**



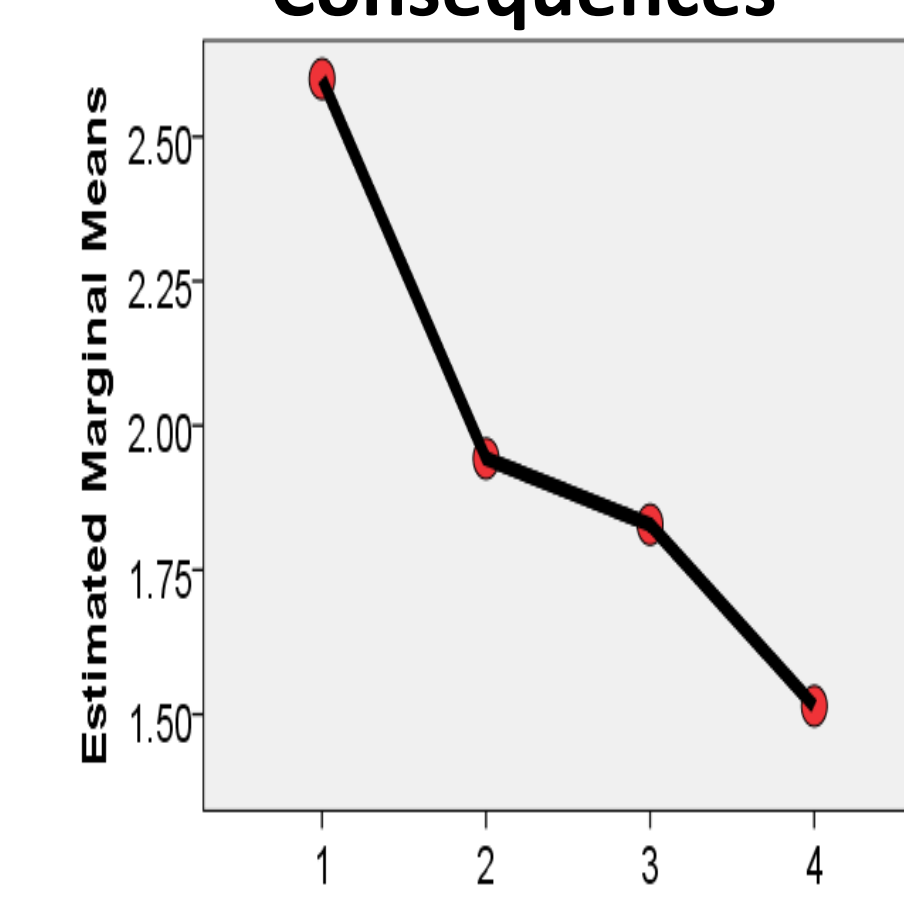
**Information**



**Assumptions & Viewpoints**



**Implications & Consequences**



**QUESTION 2a and b:** Comparison of mean initial and final total scores did not indicate significant occurrence of transfer of abilities after comprehensive approaches were used for *Problem-Solving* or *Critical Thinking* as a whole.

- ❖ However, for two components of the *Problem-Solving* rubric there were indications of transfer with significantly higher scores in the fourth case than first case for: *Planning to Solve the Problem* ( $p = .001$ ) and *Problem Solution* ( $p = .010$ ).

## Conclusions and Implications

- ❖ There were notable differences in the significant trends for *Total Problem Solving* (positive linear trend with higher final scores than initial) and *Critical* (quadratic with higher initial scores than final) scores
- ❖ Overall improvements in *Problem-Solving* but not *Critical Thinking*
- ❖ Low scores on select components (ex: *Implications and Consequences*) are ripe areas for further targeted solutions.
- ❖ May need more than one semester to make a significant difference in *Critical Thinking* abilities
- ❖ Students at the senior level may still be developing critical thinking and problem-solving skills

## Strengths & Limitations

- ❖ There was high agreement between individual rater scores and all differences were resolved via discussion
- ❖ Differences between case scores may be associated with variation between class instructor and/or complexity of the four cases

