



**MULTI-DIMENSIONAL ASPECTS OF LEARNING AND
TEACHING IN SCIENCE AND MATHEMATICS EDUCATION**



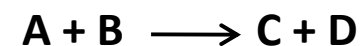
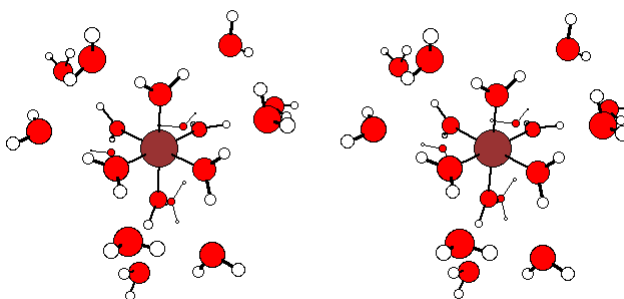
COMPARISON OF MENTAL EFFICIENCY OF INSTRUCTIONAL STRATEGY BASED ON TRIPLET MODEL OF CONTENT REPRESENTATION AND TRADITIONAL TEACHING INSTRUCTION

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Introduction

- Limited understanding of multiple levels of representation (macroscopic, submicroscopic and symbolic)



- Teachers fail to connect levels of representation

Introduction

Methodology

Results & Discussion

Conclusions

Acknowledgement

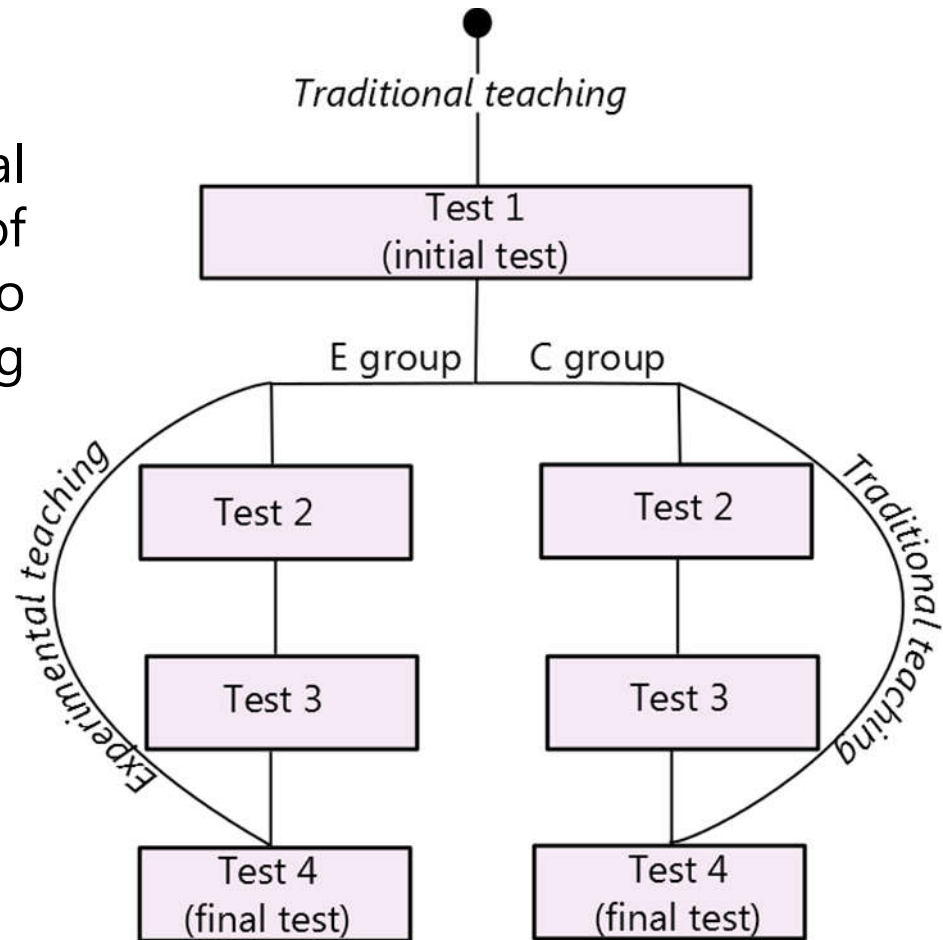
Methodology

Aim of research

- To examine efficiency of instructional strategy based on intercorrelation of multiple levels of representations and to compare it to the traditional teaching approach.

Participants

- Total sample: 313 students
- Upon equalization: 189 students



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Methodology

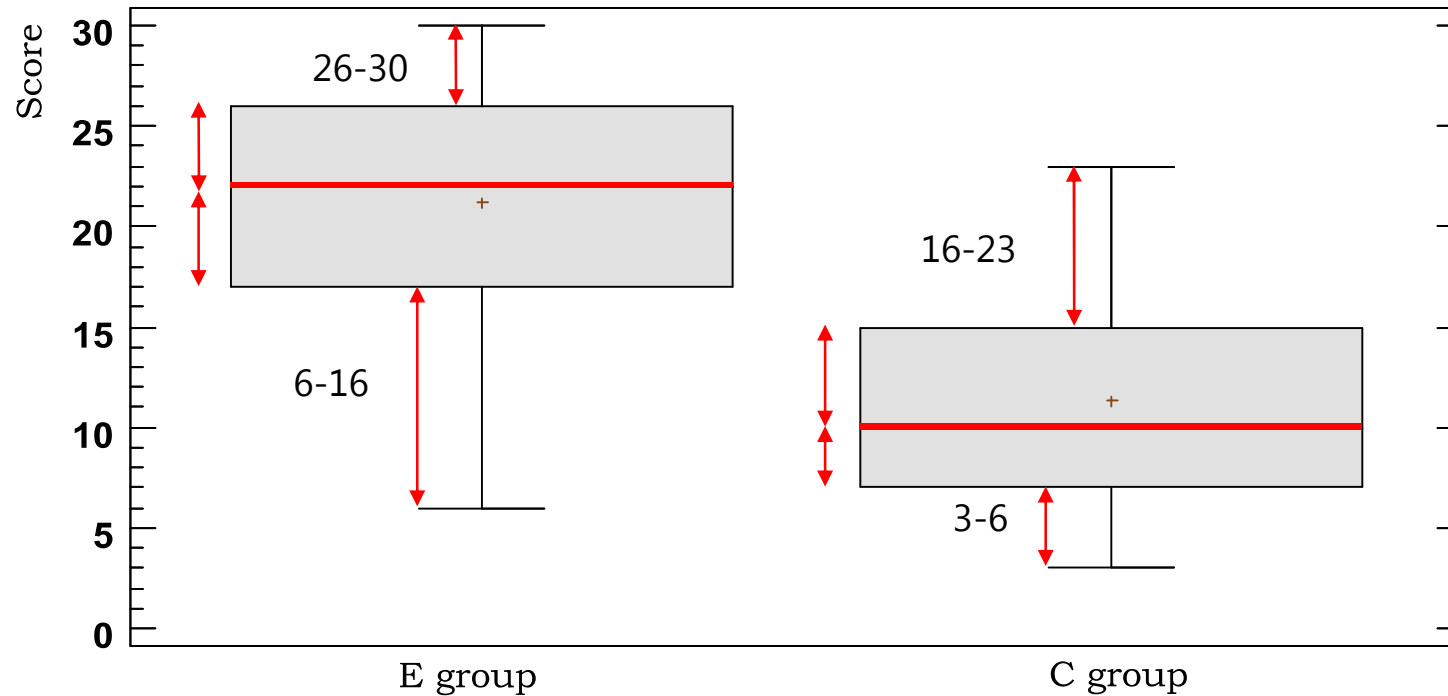
Research instruments

- Two-tier multiple-choice test for measuring performance
- Likert scale for measuring mental effort

Extremely easy	1
Very easy	2
Easy	3
Neither easy nor difficult	4
Difficult	5
Very difficult	6
Extremely difficult	7

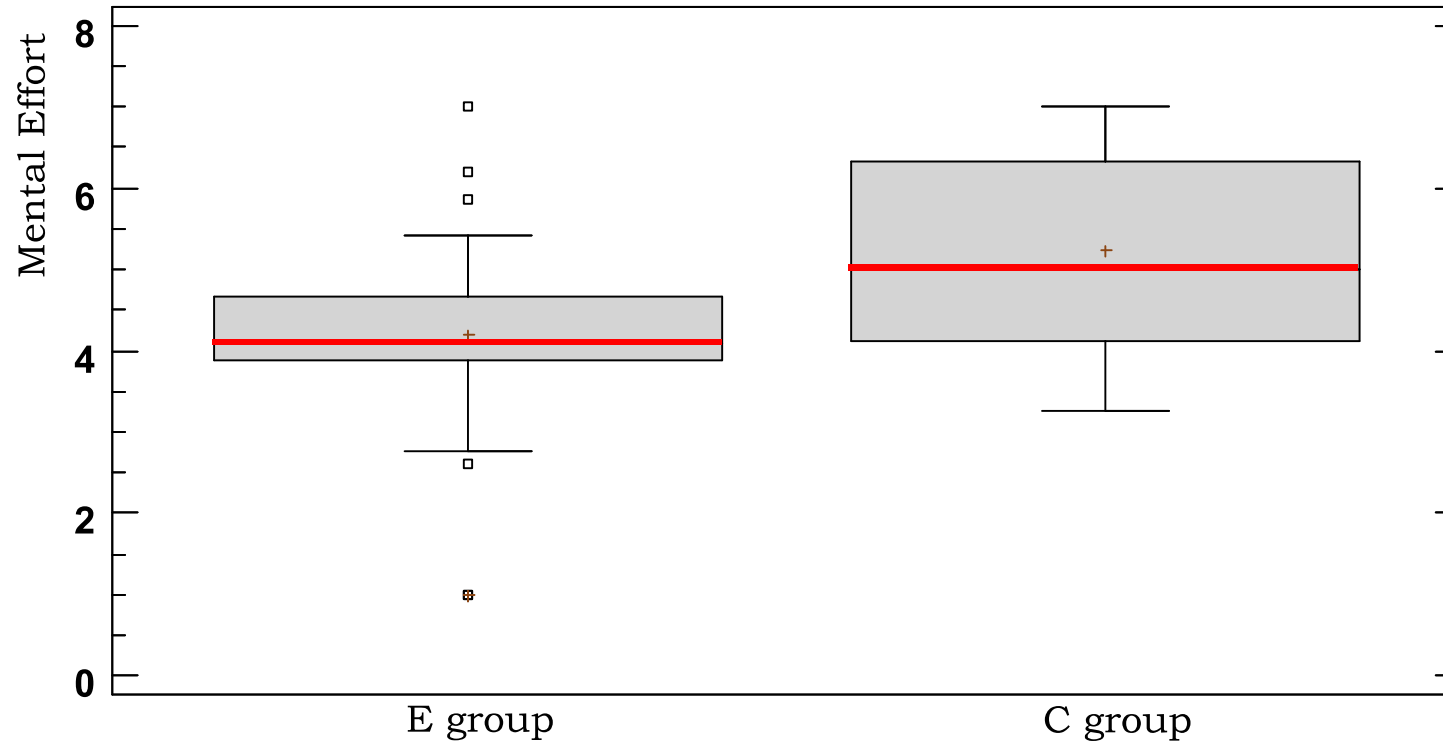
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Results and Discussion



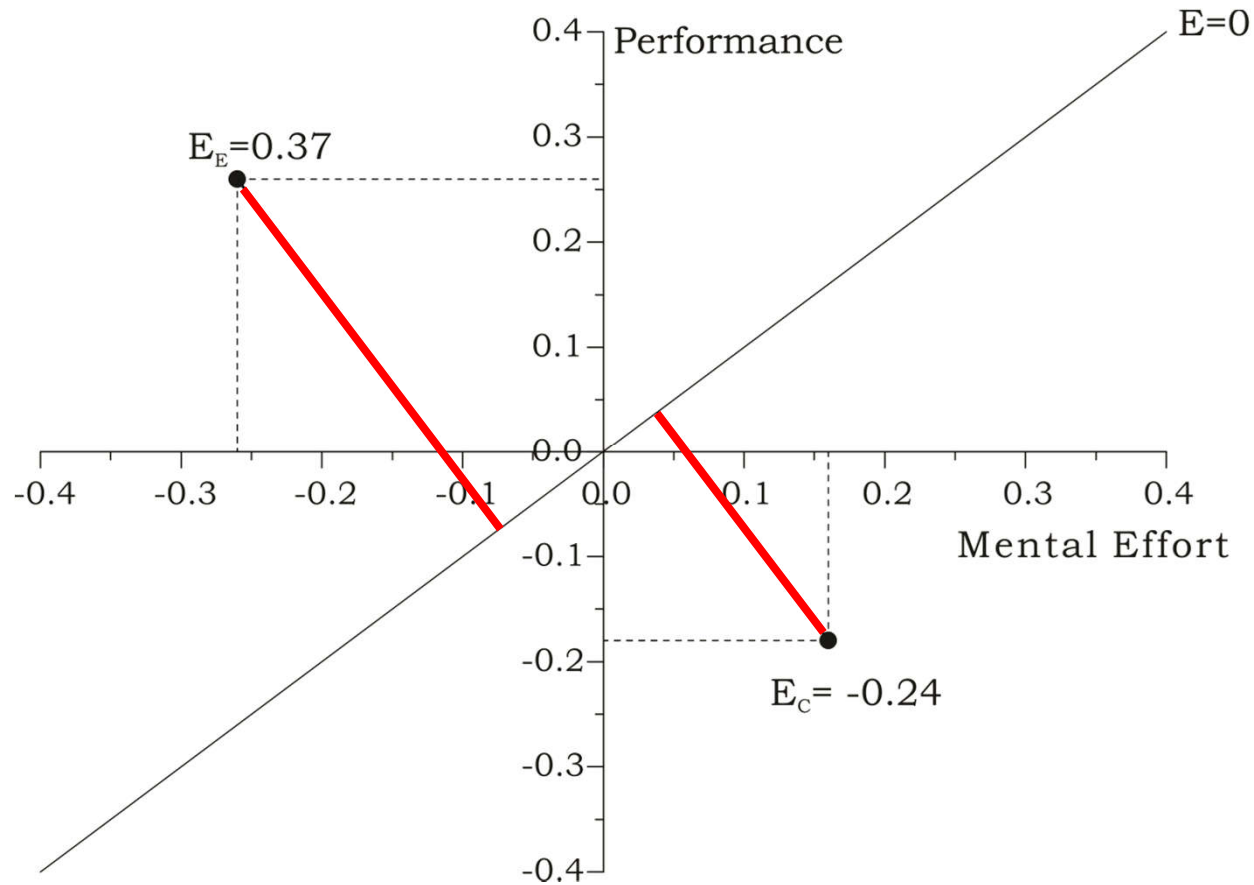
Box plot diagram of students' performance for E and C group.

Results and Discussion



Box plot diagram of students' mental effort for E and C group.

Results and Discussion



Graph of instructional efficiency for the experimental and control groups.

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Conclusion

- Highlighting the inter-connections among levels of representation, teachers help students to see the linkages between them, thus fostering their performance and reducing cognitive load.

Implication for future research

- To determine misconceptions in both groups of students (experimental and control) and to compare differences in conceptual understanding of appropriate chemical concepts between two groups.

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Acknowledgement

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Thank you for listening

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