

**Kingdom of Saudi Arabia  
Ministry of Higher Education  
Al-Imam Muhammad ibn Saud Islamic University  
Faculty of Social Sciences  
Department of Psychology**



# **The Impact of Activation of the Approximate Growth Area in the Deductive Mathematical Reasoning among Students of the Intermediate and Secondary Stages in Riyadh**

**A thesis submitted to the Department of Psychology,  
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**By**

**Nassir Mohammad Ali Al-Hammadi**

**Supervised By**

**Dr. Mohammad Ismaeel Al-Faqi  
Associate Professor of Psychology**

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# Thesis Abstract

Title of the study: The Impact of Activation of the Approximate Growth Area in the Deductive Mathematical Reasoning among Students of the Intermediate and Secondary Stages in Riyadh

**Study Objectives:** The present study aims to:

- 1- Design a proposed structural formative model in the light of the theory of the approximate growth area to further advance knowledge of the students in general education in the Kingdom of Saudi Arabia in light of the prevailing Islamic values and cultural context
- 2- Verification of hypotheses derived from the model to increase the level of mathematical reasoning in students by initial classification, which is based on pre-measurement (Novice - average - efficient - Expert)
- 3- Dealing with the cognitive potentials, rather than focusing on the mature capabilities, and therefore the current model starts with the tasks that the learner cannot perform, and help him/her to complete what he/ she could not perform individually through the proposed duals (Novice - Novice; Novice - Intermediate; Novice - efficient; average - expert).
- 4- Emphasizing the importance of classroom interaction in the learning process through dialogue and communication between learners using language as a significant psychological tool, and employ the concept of support through the proposed empirical treatment to link the actual knowledge of the learner (realism), with the future knowledge (potential).

**Study Methodology:** The study used the experimental method of Multiple-treatment Design.

**Study Sample:** The study sample consisted of (83) students from the intermediate and secondary stages, aged between (14-18) years in Riyadh City. Participants have been subjected to various experimental treatments during the first semester 1427-1428 AH.

**Tools used:**

- Balance Beam;
- A camera to photograph and record the interactions of participants, both on an individual basis or on a bilateral basis when dealing with the balance tasks

Statistical Methods: included the percentage, arithmetic mean, standard deviation, and T test for linked samples; in addition, findings have also been analyzed using repeated measurements

Study Findings: The most important findings of the study are:

- 1- There are statistically significant differences in the average scores of novice students in the level of deductive reasoning in the pre-test and post-test in favor of the post-test;
- 2- There are statistically significant differences in the average scores of intermediate students in the level of deductive reasoning in the pre-test and post-test in favor of the post-test;
- 3- No statistically significant differences in the average scores of efficient students in the level of deductive reasoning in the pre-test and post-test in favor of the post-test;
- 4- There are statistically significant differences in the average scores of expert students in the level of deductive reasoning in the pre-test and post-test in favor of the post-test;
- 5- The existence of statistically significant differences in the level of reasoning by classification (Novice - Medium - efficient - Expert), after their dual interaction with each other (novice with novice; novice with the average; novice with efficient; novice with the expert), in favor of the lower level, where the results reveal:
  - A- There is an improvement in the level of deductive reasoning for novice student after the interaction;
  - B- There is an improvement in the level of deductive reasoning of the average students after the interaction;
  - C- There is no improvement in the level of deductive reasoning of efficient students after the interaction;
  - D- There is no improvement in the level of deductive reasoning of experts after the interaction.