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The Effectiveness of Using the SOLO Taxonomy in Acquiring Students the Concepts of Coordinate Geometry

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ABSTRACT

Objective: The study aimed to investigate the effect of using the SOLO taxonomy levels on Prince Faisal Technical College students' acquisition of coordinate geometry concepts. To achieve the study's objective, **Method:** The researcher developed a test of acquisition of coordinate geometry concepts. The study used the semi-experimental approach with a pre-post design, and it was applied to (51) students from the college, who were divided into two groups: one experimental (25) student studied using the SOLO taxonomy levels, and the other controlled (26) students studied in the usual way. **Results** showed a positive effect of using the SOLO taxonomy as a strategy for teaching mathematics, especially in students' acquisition of concepts of coordinate geometry. The study recommended using the SOLO Taxonomy levels on students' acquisition of mathematical concepts in other fields such as algebra, statistics, etc. **Novelty:** This research presents novelty through the use of Solo taxonomy levels of classification in teaching mathematics, designing a teaching strategy to enable students to acquire concepts of coordinate geometry so that it is easy for teachers to implement this strategy in teaching mathematics.

INTRODUCTION

Modern mathematics is characterized by the fact that they are tight structures that are closely connected, eventually forming an integrated structure. The building blocks of this construction are mathematical concepts, as principles, generalizations, and mathematical skills rely heavily on concepts. One of the primary and essential components of mathematics is geometry, which is characterized by a logical sequence and abstraction in concepts and principles due to the multiplicity of types of mathematical knowledge in it (concepts, skills, facts, generalizations, laws, and postulates), and concepts are considered the main component in geometry (Bounou et al., 2023). Geometry concepts represent the basic rules in geometry construction, as it is one of the most important goals of the geometry learning process because understanding and applying geometry concepts correctly necessarily leads to the ability to learn various skills in geometry (Parissi et al., 2023).

Teachers seek to acquire their students' mathematical concepts using multiple methods and models, as these models enable students to build their mathematical concepts. One of these models is known as the SOLO taxonomy levels. By adopting constructivist theory, Biggs & Collis (1982) proposed a single Taxonomy to describe the learning hierarchy, in that each partial structure (level) becomes a foundation on which learning is further enhanced and expanded. The SOLO taxonomy levels include five levels of development, and these levels are arranged in terms of the

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