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Inductive Reasoning as a Strategy for Overcoming Learning Difficulties in Mathematics

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Abstract

Learning difficulties in mathematics remain a persistent challenge in many secondary schools in the KwaZulu-Natal Province of South Africa, often resulting in poor learner performance and negative attitudes toward the subject. Traditional teacher-centred instructional approaches frequently limit learners' ability to actively construct mathematical understanding. This study investigates the effectiveness of inductive reasoning as an instructional strategy for addressing learning difficulties in mathematics among secondary school learners in KwaZulu-Natal. The research adopted a quantitative descriptive research design. A sample of 120 learners and 10 mathematics teachers was selected from five public secondary schools across the province via purposive and simple random sampling techniques. Data were collected through structured questionnaires and classroom observation schedules focused on learners' engagement, problem-solving ability, and conceptual understanding. The collected data were analysed via descriptive statistics. The findings indicate that the application of inductive reasoning, where learners move from specific examples and patterns to general mathematical principles, significantly enhances learners' comprehension and participation in mathematics lessons. Learners demonstrated an improved ability to identify patterns, formulate rules, and solve mathematical problems independently. Teachers also reported that this approach increased learner confidence and encouraged active participation during lessons. The study concludes that integrating inductive reasoning strategies into mathematics instruction can effectively reduce learning barriers and support deeper conceptual understanding among learners. It is recommended that mathematics teachers in KwaZulu-Natal secondary schools receive professional development training on learner-centred pedagogical approaches that incorporate inductive reasoning techniques. Additionally, curriculum planners should encourage teaching methods that promote discovery learning and active learner engagement to improve overall mathematics achievement.

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