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Supporting 3-5 Grade Students in Solving Story Problems in Math Lessons: A Comparison of Teachers and AI Responses

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Abstract

This study investigates how elementary teachers respond to students' questions during story problem lessons in grade 3-5 and compares their responses to those generated by ChatGPT-4. The research explores the effectiveness of these responses in supporting students' problem-solving abilities and conceptual understanding. The central research question examines which type of response—teacher-generated or AI-generated—is more effective in helping students solve story problem. Data were collected through classroom observations and interviews with eight experienced elementary teachers and their 173 students. During the individual math practice time, ("you do" phase), when students had difficulty to solve problems on the worksheet, students were encouraged to ask both their teachers and ChatGPT-4 similar questions related to solve the practice questions on the worksheets. A focused group of 32 students was observed and interviews in depth. Findings reveal that ChatGPT-4's responses differ pedagogically from those of teachers. Students interview data reported preferring access to both types of responses. They favored ChatGPT-4 for simpler, direct questions but relied more heavily on their teachers for multi-step problems requiring deeper conceptual understanding. The study concludes that while AI tools like ChatGPT-4 can supplement instruction, students ultimately depend on their teachers for meaningful mathematical learning, patricianly when engage in complex reasoning.

Keywords: AI Tutoring; Elementary Mathematics Instruction; Story Problem Solving; Students Questioning