



Exploring What Teacher's Decision-Making in Designing Mathematical Assignments?: Case Studies in Beginner

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ABSTRACT

Objective: This research uses the M-Four theory to investigate how teachers design mathematical tasks based on contextual problems. **Method:** The research involves a case study approach, utilizing in-depth observations, interviews, and Mathematical Task Design Sheets (MTDS) for data collection. This study involved one Beginner Teacher (BT) (age 35) participating who was selected based on teacher experiences. Through observation results, a BT who consistently assigns contextual math problems is selected for further analysis. **Results:** The study's findings reveal that BT tends to produce contextual assignments that primarily focus on the context presented in the textbook, with minimal additions or adjustments based on real-life situations experienced by students. This research contributes to the existing literature on problem-based learning and task design by examining the perspectives of BT. It provides insights for teacher professional development programs and curriculum design. **Novelty:** The novelty of this research lies in its exploration of how BT designs mathematical tasks based on contextual problems using the M-Four theory.

INTRODUCTION

Assignments are essential in learning. A person's understanding of mathematics is closely related to his ability to generate and ask questions through assignments. Furthermore, assignments are also central to learning mathematics (Sullivan et al., 2012). Most teacher planning focuses on making assignments, and interactive teaching focuses on smoothly implementing tasks according to plan. Mathematical assignments affect students when learning in class, so teachers should choose meaningful mathematical assignments for students (Antonijević, 2016; Martin et al., 2015).

For this reason, teachers need to develop skills in designing mathematical assignments. Some literature reveals that designing assignments is an essential skill that mathematics teachers need to develop, for instance, analyzing the difficulty level of questions, representing real situations to mathematical problems, and developing mathematical contextual problems (Breen & O'Shea, 2021; Jones & Pepin, 2016; Lee, 2017). Lee (2017) confirmed that designing math assignments is one way to develop teaching skills. However, designing or modifying assignments is an obstacle for some teachers in learning. Inadequate teacher content knowledge and experience in designing assignments or modifying assignments (Breen & O'Shea, 2021) will impact student development if the assignments only focus on students' math books.

Tasks designed can be based on the demands and goals of the teacher for understanding and developing strategies, procedural skills, and thinking skills. This case is by the demands of the 2013 Curriculum expecting math teachers to present assignments in the form of problems. The problem is used as a starting point in learning so that students are accustomed to developing their thinking skills. Problems are

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