PENCAPAIAN KEMAMPUAN PENALARAN MATEMATIS SISWA MELALUI IMPLEMENTASI DESAIN DIDAKTIS PADA MATERI BARISAN DAN DERET

TESIS

Diajukan untuk Memenuhi Sebagian dari Syarat untuk Memperoleh
Gelar Magister Pendidikan Pada Program Studi Pendidikan Matematika

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ABSTRAK

Rahmat Kusharyadi (2208156). **Pencapaian Kemampuan Penalaran Matematis Siswa Melalui Implementasi Desain Didaktis Pada Materi Barisan Dan Deret.**

Penelitian ini bertujuan untuk menyusun desain didaktis materi barisan dan deret yang mengakomodir kemampuan penalaran matematis siswa. Penelitian ini dilakukan berdasarkan temuan *learning obstacle* (LO) dan analisis *learning trajectory* (LT) siswa dalam mempelajai materi barisan, dan deret. *Didactic Design Research* (DDR) dipilih sebagai metode dalam penelitian ini yang terdiri atas tiga tahap, yaitu a) analisis prospektif; b) analisis metapedadidaktik; c) analisis retrospektif. Berdasarkan analisis prospektif teridentifikasi gambaran umum kemampuan penalaran matematis siswa dan beberapa hambatan epistemologis siswa berdasarkan 3 indikator, yaitu hambatan konseptual, prosedural, dan teknik operasional. Temuan ini sebagai dasar untuk menyusun desain didaktis hipotetik. Desain didaktis yang disusun terdiri dari empat *lesson design*. *Lesson design* pertama disusun untuk mengatasi karakteristik LO pada sub materi pola, dan barisan aritmatika. *Lesson design* kedua disusun untuk mengatasi LO pada sub materi barisan geometri. *Lesson design* ketiga disusun untuk mengatasi LO pada sub materi deret aritmatika. *Lesson design* keempat untuk mengatasi LO pada sub materi deret geometri. Keempat *lesson design* dijadikan sebuah bahan ajar barisan, dan deret untuk empat kali pertemuan. Analisis metapedadidaktik, dan retrospektif selama proses pembelajaran memberikan gambaran LO yang dialami oleh siswa, dan gambaran umum kemampuan penalaran matematis siswa setelah implementasi desain didaktis hipotetis. Desain didaktis hipotetis yang diterapkan dapat mengantisipasi karakteristik LO yang sudah teridentifikasi sebelumnya.

Kata Kunci: DDR, barisan, dan deret, *learning obstacle*, kemampuan penalaran matematis

ABSTRACT

Rahmat Kusharyadi (2208156). **Achievement Of Students' Mathematical Reasoning Abilities Through the Implementation of Didactic Design on Sequence and Series Topic.**

This study aims to develop a didactic design for sequence and series material that accommodates students' mathematical reasoning abilities. This study was conducted based on the findings of learning obstacles (LO) and learning trajectory (LT) analysis of students in studying sequence and series material. Didactic Design Research (DDR) was chosen as the method in this study which consists of three stages, namely a) prospective analysis; b) metapedadidactic analysis; c) retrospective analysis. Based on the prospective analysis, a general description of students' mathematical reasoning abilities and several epistemological obstacles were identified based on 3 indicators, namely conceptual, procedural, and operational technique obstacles. These findings are the basis for developing a hypothetical didactic design. The didactic designs that were developed consisted of four lesson designs. The first lesson design was developed to address the characteristics of LO in the sub-material of patterns and arithmetic sequences. The second lesson design was developed to address LO in the sub-material of geometric sequences. The third lesson design was developed to address LO in the sub-material of arithmetic series. The fourth lesson design was developed to address LO in the sub-material of geometric series. The four lesson designs were used as teaching materials for sequences and series for four meetings. Metapedadidactic and retrospective analysis during the learning process provided a picture of the LO experienced by students, and a general picture of students' mathematical reasoning abilities after the implementation of the hypothetical didactic design. The hypothetical didactic design applied can anticipate the characteristics of the LO that have been previously identified.

Kata Kunci: DDR, sequence and series, *learning obstacle*, mathematical reasoning abilities

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DAFTAR GAMBAR

DAFTAR TABEL

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