

ABSTRAK

Hestu Wilujeng (2019). Peningkatan Kemampuan Berpikir Aljabar dan Multirepresentasi Matematis serta Pencapaian *Self Determination* Siswa SMP melalui *Merrill's First Principles of Instruction*.

Tujuan penelitian ini adalah mengkaji perbedaan pencapaian dan peningkatan kemampuan berpikir aljabar, kemampuan multirepresentasi matematis dan *self determination theory* (SDT) berdasarkan keseluruhan, kategori kemampuan awal matematis (KAM) serta peringkat sekolah (PS). Metode penelitian ini adalah kuasi eksperimen dengan desain penelitian *Pretest-Posttest Control Group Design*. Subyek dalam penelitian ini sebanyak 124 siswa SMPN kota Tangerang. Proses pembelajaran yang dilakukan yaitu *Merrill's First Principles of Instruction* (MFPI) dan pembelajaran biasa. Hasil penelitian menunjukkan bahwa secara keseluruhan pembelajaran MFPI berpengaruh terhadap kemampuan berpikir aljabar, kemampuan multirepresentasi matematis dan SDT. Pembelajaran MFPI lebih meningkatkan kemampuan berpikir aljabar dan multirepresentasi matematis pada siswa kategori KAM tinggi dan KAM sedang. Pembelajaran MFPI menuntut siswa membangun pengetahuan melalui pengalaman siswa dan mengintegrasikan pengetahuan tersebut dalam kehidupan sehari-hari. Pada kategori PS sedang, pencapaian dan peningkatan kemampuan berpikir aljabar, kemampuan multirepresentasi matematis dan SDT lebih baik daripada kategori PS tinggi. Interaksi hanya terjadi pada kemampuan SDT terhadap pembelajaran dan PS. Selain itu tidak terdapat interaksi pada pencapaian dan peningkatan kemampuan yang diukur terhadap pembelajaran, PS dan KAM. Siswa kategori KAM sedang memiliki ragam jawaban yang beragam dari semua aspek, sedangkan kategori KAM tinggi tersebar pada ragam jawaban benar dan kurang tepat. Kategori KAM rendah tersebar pada ragam jawaban kurang tepat sampai tidak ada jawaban.

Kata kunci : Kemampuan berpikir aljabar, kemampuan multirepresentasi matematis, *self determination*, *Merrill's First Principles of Instruction*

Hestu Wilujeng, 2019

PENINGKATAN KEMAMPUAN BERPIKIR ALJABAR DAN MULTIREPRESENTASI MATEMATIS
SERTA PENCAPAIAN *SELF DETERMINATION* SISWA SMP MELALUI *MERRIL'S FIRST
PRINCIPLES OF INSTRUCTION*

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ABSTRACT

Hestu Wilujeng (2019). The Enhancement of Students' Algebraic Thinking and Mathematical Multiple representation, and Their Achievement in Self Determination through Merrill's First Principles of Instruction

This study aims at examining the difference of students' achievement and enhancement in Algebraic thinking ability, mathematical multiple representation ability, and self determination (SDT), viewed from learning in general, Mathematical Prior Ability (high, middle and low) and school level (high and middle). The method of this study is a quasi-experimental with Pretest-Posttest Control Group Design. The research subject was 124 students. The learning process employed Merrill's First Principles of Instruction (MFPI) and regular learning. The research result shows that in general, MFPI gives impact on the students' Algebraic Thinking ability, Mathematical Multirepresentation Ability, and SDT. Learning through MFPI dominantly enhanced the students' Algebraic Thinking ability, Mathematical Multirepresentation Ability, and SDT on high mathematical prior ability category. MFPI learning requires the students to construct knowledge and meaning from the students' experiences and integrate the knowledge with daily life problems. In middle school level category, the students' algebraic thinking skill, MMA, and SDT are better than that of high school level category. There was interaction between SDT ability toward learning and school level, meanwhile there was no interaction on the measured achievement and ability improvement toward learning, school level and mathematical prior ability. From the students' answer variation analysis, the students' answers more varied in the middle mathematical prior ability compared to the other categories, meanwhile in high mathematical prior ability, the students' answer varied from correct and incorrect answers. In the low mathematical prior ability, the students' answers varied from incorrect to no answer.

Keywords: algebra thinking skill, mathematical multiple representation, self determination, and Merrill's First Principles of Instruction

Hestu Wilujeng, 2019

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