ANALISIS TRANSISI BERPIKIR ARITMETIK KE BERPIKIR ALJABAR PADA PEMBELAJARAN MATEMATIKA DITINJAU DARI GAYA KOGNITIF *FIELD DEPENDENT* DAN *FIELD INDEPENDENT*

TESIS

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar
Magister Pendidikan Matematika

Oleh

Rauzah
NIM 1706922

PROGRAM STUDI PENDIDIKAN MATEMATIKA
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LEMBAR HAK CIPTA

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Oleh:

Rauzah

S. Pd. Universitas Syiah Kuala, 2015.

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister Pendidikan pada Program Studi Pendidikan Matematika

HALAMAN PENGESAHAN

TESIS

ANALISIS TRANSISI BERPIKIR ARITMETIK KE BERPIKIR ALJABAR PADA PEMBELAJARAN MATEMATIKA DITINJAU DARI GAYA KOGNITIF *FIELD DEPENDENT* (FD) DAN *FIELD INDEPENDENT* (FI)

Oleh:

RAUZAH

1706922

Disetujui dan disahkan oleh:

Pembimbing I

Dr. Kusnandi, M.Si.

NIP. 19690330 199303 1 002

Pembimbing II

Al Jupri, S. Pd., M.Sc., Ph.D.

NIP. 19820510 200501 1 002

Mengetahui,

Ketua Program Studi Pendidikan Matematika

Dr. H. Dadang Juandi, M.Si.

NIP. 19640117 199202 1 001

ABSTRAK

Rauzah (2019).Analisis Transisi Berpikir Aritmetik ke Berpikir Aljabar pada Pembelajaran Matematika Ditinjau dari Gaya Kognitif *Field Dependent* (FD)dan *Field Independent* (FI).

Transisi dari berpikir aritmetik ke berpikir aljabar (berpikir aljabar permulaan) merupakan sebuah langkah yang paling sulit dalam kehidupan matematika siswa. Di Indonesia, siswa mulai diperkenalkan dengan aljabar di kelas VII SMP setelah sebelumnya selama 6 tahun belajar aritmetika di sekolah dasar. Wu (2009) mengatakan bahwa proses penggantian bilangan dengan variabel ini merupakan suatu lompatan yang besar. Penelitian ini bertujuan untuk menyelidiki bagaimana strategi dan mode representasi siswa SMP dalam memecahkan masalah aljabar permulaan ditinjau dari gaya kognitif *Field Dependent* (FD) *dan Field Independent* (FI).Dua kategori masalah aljabar permulaan yang digunakan dalam penelitian ini yaitu masalah generalisasi yang dikhususkan pada generalisasi pola bilangan dan soal cerita yang mencakup *unknown quantities.*Proses pemecahan masalah dari soal aljabar permulaan ini. Data yang diperlukan dikumpulkan melalui rekaman suara, *Group Embedded Figure Test* (GEFT), lembar jawaban siswa, dan wawancara.Penelitian ini melibatkan siswa kelas VII pada salah SMP negeri di Kabupaten Bandung Barat tahun ajaran 2018/2019. Data yang diperoleh dianalisis secara deskriptif menggunakan pendekatan kualitatif. Hasil analisis menunjukkan bahwa baik siswa FI maupun siswa FD cenderung mengunakan strategi menyusun kalimat terbuka ketika menyelesaikan soal cerita. Namun yang membedakan keduanya adalah penggunaan strategi tambahan oleh siswa FD berupa strategi *guess and check*. Strategi yang digunakan siswa FI dalam meyelesaikan masalah generalisasi pola hanya meliputi 4 dari 9 strategi yang dikembangkan oleh para ahli yaitu strategi *counting, recursive difference-rate adjustment* dan *explicit.* Begitupun siswa FD yang hanya menggunakan strategi *counting, guess and check,* dan *different-rate no adjusment*. Disamping itu, mode representasi yang digunakan oleh siswa FI dalam menyelesaikan soal cerita meliputi representasi verbal dan simbolik aljabar dan representasi simbolik aljabar, sedangkan siswa FD menggunakan representasi verbal dan simbolik aritmetika dan representasi verbal. Mode representasi yang digunakan oleh siswa bertipe FI dalam menyelesaikan masalah generalisasi pola meliputi representasi visual dan simbolik aljabar dan representasi simbolik aljabar, sedangkan siswa FD menggunakan representasi visual dan verbal dan representasi simbolik aritmetika. Melalui penggunaan strategi dan mode representasi ini menunjukkan siswa FI mampu memenuhi seluruh indikator berpikir aljabar permulaan mampu, sedangkan FD hanya memenuhi sebagian indikator berpikir aljabar permulaan saja.

Kata-kata kunci: Berpikir aritmetika, berpikir aljabar permulaan, berpikir aljabar, generalisasi pola bilangan, soal cerita, strategi, mode representasi, gaya kognitif *field dependent* dan *field independent.*

ABSTRACT

Rauzah (2019). Analysis of Transition from Arithmetic Thinking ito Algebraic Thinking on Mathematics Learning Viewed from the Cognitive Style of *Field Dependent* (FD) and *Field Independent* (FI).

The transition from arithmetic thinking to algebraic thinking (initial algebraic thinking) is the most difficult step in a student's mathematical life. In Indonesia, students began to be introduced to Algebra in Grade VII of Junior High School after previously having studied arithmetic for 6 years in elementary school. Wu (2009) states that the process of replacing numbers with this variable is a big leap. This study aims to investigate how the strategies and modes of representation of junior high students in solving initial algebra problems in terms of cognitive styles of field dependent (FD) and field independent (FI). The two initial algebraic problem categories used in this study are the generalization problem thatinclude the generalization of number patterns and word problems that include unknown quantities.The process of problem solving of the initial algebra problem is analyzed to identify cognitive aspects of the process solution, namely the solution strategy and representation mode. The required data is collected through voice recordings, Group Embedded Figure Test (GEFT), student answer sheets, and interviews. This study involved VII grade students in one of junior high schools in West Bandung Regency in the academic year 2018/2019. The data obtained were analyzed descriptively using a qualitative approach. The results of the analysis show that both FI students and FD students tend to use strategies to compile open sentences when solving word problems. But what distinguishes the two is the use of additional strategies by FD students in the form of a guess and check strategy.The strategy used by FI students in solving the problem of pattern generalization only included 4 of 9 strategies developed by experts, namely counting strategies, recursive difference-rate adjustments and explicit. Likewise, FD students only use counting strategies, guess and check, and different-rate no adjustments.Besides that, the representation mode is used by internal FI students solving word problems includes verbal and algebraic symbolic representations and algebraic symbolic representation, while FD students use verbal and arithmetic symbolic representations and verbal representation. The representation mode used by FI students in solving the problem of pattern generalization includes visual and algebraic symbolic representations and algebraic symbolic representations, while FD students use visual and verbal representations and arithmetic symbolic representations. Through the use of strategies and representation modes shows tahat FI students are able to satisfy all indicators of initial algebraic thinking, while FD only satisfies some of indicators of the initial algebraic thinking.

Keywords: Arithmetic thinking, initial algebraic thinking, algebraic thinking, generalization of number patterns, word problems, strategies, representation modes, field dependent and field independent cognitive styles.

DAFTAR ISI

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DAFTAR GAMBAR

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Lampiran Halaman

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