# KEMAMPUAN TRANSLASI REPRESENTASI MATEMATIS DAN DETERMINASI DIRI MAHASISWA MELALUI MODEL PEMBELAJARAN OSKAR MENGGUNAKAN PENDEKATAN INDUKTIF-DEDUKTIF

## DISERTASI

**diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar**
**Doktor Pendidikan Matematika**


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# ABSTRAK

**Khairunnisa**. **(2023).** Kemampuan Translasi Representasi Matematis dan Determinasi Diri Mahasiswa melalui Model OSKAR menggunakan pendekatan Induktif-Deduktif.

Kemampuan translasi representasi matematis (KTRM) menggambarkan pemahaman individu terhadap objek matematika karena matematika dipelajari melalui representasi, baik secara verbal, visual, maupun simbolis. Namun, sebagian besar mahasiswa mengalami kesulitan melakukan translasi dari representasi verbal ke simbolis dan sebaliknya. Determinasi diri mahasiswa merupakan kondisi terpenuhinya tiga kebutuhan psikologis dasar siswa, otonomi, kompetensi, dan keterkaitan, yang dapat memfasilitasi motivasi intrinsik mahasiswa untuk melanggengkan minat dan ketertarikan mereka terhadap matematika. Model pembelajaran yang dapat mendukung determinasi diri mahasiswa belum banyak dipelajari. Oleh karena itu, penelitian ini bertujuan untuk menganalisis kemampuan translasi representasi matematis mahasiswa yang meliputi indikator translasi dari representasi simbolis ke representasi verbal dan sebaliknya, serta menganalisis penerapan model pembelajaran Orientasi Situasi Awal Kriteria Aksi berpola Refleksi menggunakan pendekatan induktif-deduktif" (MPOID) dan model pembelajaran langsung (MPL) untuk meningkatkan kemampuan translasi representasi matematis dan determinasi diri mahasiswa berdasarkan pengetahuan matematika awalnya (PAM). Penelitian ini menggunakan metode kuasi-eksperimen dengan desain kelompok kontrol pre-test and post-test. Subyek penelitian adalah mahasiswa S1 pendidikan matematika semester III 2020/2021. Pengumpulan data peningkatan KTRM menggunakan tes uraian KTRM. Statistik uji yang digunakan untuk menganalisis data KTRM adalah uji-t, uji-t', dan uji Mann-Whitney. Pengumpulan data perubahan determinasi diri mahasiswa menggunakan angket. Data determinasi diri ini diolah menggunakan model Rasch dengan teknik stacking. Hasil penelitian menunjukkan bahwa perbedaan peningkatan KTRM antara mahasiswa yang mendapatkan MPOID dan mahasiswa yang mendapatkan MPL tidak signifikan baik secara keseluruhan maupun per kategori PAM. Namun terdapat perbedaan yang signifikan pada indikator representasi visual ke representasi visual dalam bentuk tabel, representasi visual dalam bentuk tabel ke representasi simbolis, dan representasi visual dalam bentuk grafis ke representasi verbal secara keseluruhan. Model pembelajaran dan PAM tidak dapat memberikan pengaruh interaksi kepada KTRM dan determinasi diri mahasiswa. Penelitian ini berdampak pada perlunya penerapan MPOID pada pembelajaran luring.

Kata Kunci: translasi representasi, kemampuan translasi matematis, determinasi diri, model pembelajaran OSKAR, induktif-deduktif, translasi matematis, *self-determination theory*, MPOID

# ABSTRACT

**Khairunnisa. (2023).** Mathematical Representation Translation Ability and Self-Determination of Students through the OSKAR Learning Model using an Inductive-Deductive approach.

*Mathematical representation translation ability (KTRM) describes an individual's understanding of mathematical objects because mathematics is learned through representation, both verbally, visually, and symbolically. However, most students have difficulty translating from verbal representations to symbols and vice versa. Student self-determination is a condition of fulfilling three basic psychological needs of students, autonomy, competence, and relatedness, which can facilitate students' intrinsic motivation to perpetuate their interest and interest in mathematics. Learning models that can support student self-determination have not been widely studied. Therefore, this study aims to analyze the translation skills of students' mathematical representations, which include translation indicators from symbolic representations to verbal representations and vice versa, as well as analyze the application of the "Learning Model: Orientation, Initial Situation, Criteria, Patterned Action, and Reflection using an inductive- deductive" (MPOID) and "direct learning models" (MPL) to improve students' mathematical representation translation skills and self-determination based on their prior knowledge of mathematics (PAM). This study used an experimental method with a pre-test and post-test control group design. The research subjects were undergraduate students in mathematics education in the third semester of the 2020/2021 academic year. Collecting data on students' KTRM improvement using the KTRM description test. The test statistics used to analyze the KTRM data are the t-test, t-test, and the Mann-Whitney test. Collecting data on changes in student self-determination using a questionnaire with a scale of one to five. This self-determination data is processed using the Rasch Model with a stacking technique. The results showed that the difference in the increase in KTRM between students who received MPOID and those who received MPL was insignificant either overall or per the PAM category. However, there are significant differences overall in the indicators of visual representation with visual representation in tabular form, visual representation in tabular form with symbolic representation, and visual representation in graphic form with verbal representation. The learning model and PAM cannot interact with KTRM and student independence. This research impacts the need to apply MPOID to offline learning.*

**Key words**: *translation of representation, mathematical translation ability self-determination, OSKAR learning model, inductive-deductive, mathematical translation, self-determination theory, MPOID*

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