

**TRANSPOSISSI DIDAKTIK DALAM KONSEP PERTIDAKSAMAAN:  
SEBUAH STUDI FENOMENOLOGI**

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**Diajukan untuk Memenuhi Sebagian dari Syarat Memperoleh Gelar  
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**TRANSPOSISI DIDAKTIK DALAM KONSEP PERTIDAKSAMAN:  
SEBUAH STUDI FENOMENOLOGI**

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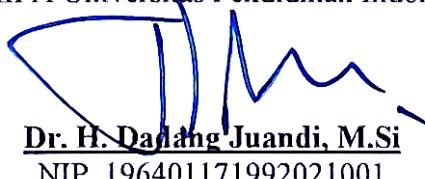
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## ABSTRAK

**Muhammad Daut Siagian (2023).** Transposisi Didaktik dalam Konsep Pertidaksamaan: Sebuah Studi Fenomenologi.

Penelitian ini bertujuan menghasilkan pengetahuan yang terjastifikasi melalui penyelidikan bagaimana proses transposisi internal (dari *knowledge to be taught* ke *taught knowledge*) yang dialami oleh guru dalam mengajarkan konsep pertidaksamaan linear, serta mengeksplorasi pembentukan konsep pertidaksamaan pada diri siswa melalui eksplorasi pengalaman belajarnya dan melalui penyelidikan hambatan belajar yang dialaminya. Rancangan penelitian kualitatif dengan pendekatan fenomenologi dipilih untuk mencapai tujuan penelitian dengan melibatkan 22 siswa kelas 11. Hasil penelitian menunjukkan bahwa sifat urutan pada  $\mathbb{R}$  dan definisi “Misalkan  $a, b \in \mathbb{R}$ ; Jika  $a - b \in \mathbb{P}$ , maka kita dapat menuliskannya sebagai  $a > b$  (atau ekuivalen  $b < a$ ); Jika  $a - b \in \mathbb{P} \cup \{0\}$ , maka kita dapat menuliskannya sebagai  $a \geq b$  (atau ekuivalen  $b \leq a$ ), merupakan dasar yang digunakan untuk menurunkan “aturan pertidaksamaan”. Makna  $a > b$  menurut *scholarly knowledge* yaitu, jika  $a - b$  adalah positif, atau dengan kata lain selisih antara  $a$  dan  $b$  lebih dari nol. Sedangkan makna  $a \geq b$ , yaitu jika  $a - b$  adalah positif dan gabungan 0. Namun, makna atau pengetahuan ini tidak diperkenalkan atau tidak sampai kepada siswa. Temuan penelitian juga menunjukkan bahwa sebagian besar siswa memahami pertidaksamaan sebagai membandingkan dua nilai. Juga, siswa cenderung memandang pertidaksamaan sebagai persamaan. Disamping itu, diperoleh tujuh ragam *concept image* siswa terkait dengan konsep pertidaksamaan, yaitu perkalian dan pembagian terhadap bilangan negatif tidak merubah tanda ketaksamaan; generalisasi konsep pertidaksamaan linear yang melibatkan nilai mutlak pada konsep pertidaksamaan linear satu variabel; tidak ada perbedaan makna notasi interval terbuka dan tertutup dalam mengekspresikan bentuk pertidaksamaan; pertidaksamaan sebagai alat untuk membandingkan besaran-besaran yang diketahui; pertidaksamaan sebagai ekspresi dan proses aljabar; sistem pertidaksamaan linear dua variabel sebagai teknik dalam menyelesaikan pertidaksamaan linear dua variabel; dan hanya ada satu nilai bilangan real dari variabel dalam pertidaksamaan yang membuat pertidaksamaan itu benar. Secara keseluruhan, berdasarkan eksplorasi pemahaman siswa terhadap konsep pertidaksamaan ditemukan adanya hambatan belajar (ontogenik, didaktik, dan epistemologis) yang dialami siswa.

**Kata Kunci:** Transposisi didaktik; pertidaksamaan; *concept image*; praksiologi; *learning obstacle*.

## ABSTRACT

**Muhammad Daut Siagian (2023).** Didactic Transposition in the Concept of Inequality: A Phenomenological Study.

This study aims to explore teacher experience through investigating how the internal transposition process (from knowledge to be taught to taught knowledge) is carried out by teachers in teaching the concept of linear inequality, as well as exploring the meaning of the concept of inequality in students through exploring their learning experiences and investigating learning obstacles. The research design with a qualitative approach using the phenomenological method was chosen to achieve the research objectives by involving 22 students in grade 11. The research results show that the nature of the order in  $\mathbb{R}$  and the definition of "Suppose  $a, b \in \mathbb{R}$ ; if  $a - b \in \mathbb{P}$ , then we can write it as  $a > b$  (or equivalently  $b < a$ ); if  $a - b \in \mathbb{P} \cup \{0\}$ , then we can write it as  $a \geq b$  (or equivalently  $b \leq a$ ), which is the basis used to derive the "rule of inequality". According to scholarly knowledge,  $a > b$  means that  $a - b$  is positive, or that the difference between  $a$  and  $b$  is greater than zero. While the meaning of  $a \geq b$  is if  $a - b$  is positive and the combination is 0. However, this meaning or knowledge is not introduced or does not reach students. The research findings also show that most students understand inequality as a comparison of two values. Also, students tend to view inequality as equality. In addition, seven kinds of student concept images were obtained related to the concept of inequality, namely: multiplication and division of negative numbers do not change the sign of the inequality; generalization of the concept of linear inequalities involving absolute values in the concept of one-variable linear inequalities; there is no difference in the meaning of open and closed interval notations in expressing forms of inequality; inequalities as a tool to compare known quantities; inequalities as expressions and algebraic processes; a system of two-variable linear inequalities as a technique for solving two-variable linear inequalities. Overall, based on the exploration of students' understanding of the concept of inequality, it was found that there were learning obstacles (ontogenetic, didactic, and epistemological) experienced by students.

**Keywords:** Didactic transposition; inequality; concept image; praxeology; learning obstacles.

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