Department of Mathematics and Statistics

Special Colloquium

Role of structure of equations in identifying students' conception of equivalence

Dr. Rashmi Singh

Abstract: The purpose of this study was to establish the reliability and validity of the construct map for students' conception of equivalence with special emphasis on investigating the impact of the structure of the equation on students' conception of equivalence. The study examined the role of the structure of the equation, specifically place value and position of box or unknown, in identifying students' conception of equivalence. Emphasizing the structure of the equation, a modified construct map of students' conception of equivalence was designed by introducing new intermediate levels. An equivalence assessment was designed which comprises items of different numeric structures to assess knowledge associated with each level of the construct map. This study utilized a mixed-method sequential explanatory design. The result from quantitative phase using Rasch analysis suggested that the modified construct map appropriately incorporates students' transition from basic operational to full relational understanding. Qualitative findings aided in identifying and describing the cognitive processes underlying the students' responses on the written assessment items and provide confirmatory evidence for validity. These findings indicated that the modified construct map for students' conception of equivalence is reliable and valid. Specifically, findings suggest more attention be paid to the role of place value in the teaching and learning of equivalence.

Keywords: Structure of equation, equivalence, mathematics education, elementary grades.

Tuesday, Feb. 7, 11:05 – 11:50 am in 8-241