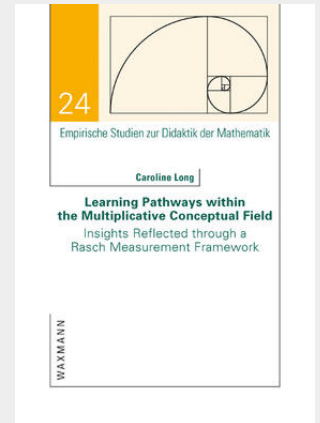


Long

## Learning Pathways within the Multiplicative Conceptual Field

Insights Reflected through a Rasch Measurement Framework

The transition from whole numbers to rational numbers and the associated mastery of the multiplicative conceptual field constitute an important development in lower secondary schooling. This study draws primarily on the theory of conceptual fields as a framework that is mathematical and enables a cognitive perspective by identifying the concepts- and theorems-in-action that lead to underlying concepts and theorems. Application of the Rasch model configures the location of both item difficulty and learner proficiency on one scale. Diagnostics explore the validity of the instrument for Measurement. The ordering of items enables the analysis of hierarchical conceptual strands and additional insights into the mastery of concepts by subSets of learners at particular levels. The resulting matrix, of interactions of learner proficiency and item Complexity, provides an overview of the concepts attained and not yet mastered. These insights permit teacher interventions specific to each learner subSet at a shared common current zone of proximal development along the scale.



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