

UNDERSTANDING THE DEVELOPMENT OF THE PROVING PROCESS WITHIN A DYNAMIC GEOMETRY ENVIRONMENT

Nguyễn Danh Nam

TÓM TẮT:

Argumentation and proof have played a fundamental role in mathematics education in recent years. In particular, a strand of the research has studied the functions of proof and the impact of new technologies on supporting students overcoming their difficulties in proof-related problems. In this research, I have also investigated the development of proving process within a dynamic geometry environment in order to provide tertiary students a strategy for proving. As a result, I have classified different levels of proving and designed an interactive help system corresponding with these levels. This system makes a contribution to bridge the cognitive and structural gaps between conjecture and proof. It also improves students' level of proving and develops their dynamic visual thinking. The findings of the research have revealed that a dynamic geometry environment provides data and 'observed facts' for realizing geometric invariants and producing arguments. I also used Toulmin's model of argumentation to analyze student's arguments and the role of abduction in transition from spatio-graphical field to theoretical field during process of writing a deductive proof. Furthermore, this research provides mathematics teachers some basic conditions for understanding the development of proving process and opens a valuable discussion on the role of dynamic visual thinking to support students in realizing geometric invariants.