

KEY WORD: EXPERT-NOVICE / DOMAIN-SPECIFIC KNOWLEDGE / PROBLEM-SOLVING  
PROCESS / METACOGNITION

TONGLAW WONG - IN : AN ANALYSIS OF DOMAIN - SPECIFIC KNOWLEDGE,  
PROBLEM - SOLVING PROCESS, AND METACOGNITION OF SECONDARY SCHOOL  
STUDENT EXPERTS AND NOVICES IN MATHEMATICAL PROBLEM - SOLVING.

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The purposes of this investigation were to analyze the domain-specific knowledge, the problem-solving process, and the metacognition of the secondary school student experts and novices in mathematical problem-solving. The samples were 25 experts from lower high schools, 25 experts from upper high schools, 25 novices from lower high school, and 25 novices from upper high schools. The instruments used in data gathering comprised the Domain-Specific Knowledge Test, the Problem-solving Process Test, and the Metacognitive Knowledge Questionnaire. The students were individually tested by interviewing and think aloud technique. The data were analyzed by using Two-Way Analysis of Variance.

The findings showed that 1) the student experts in mathematical problem solving, both in lower and upper high schools, showed higher scores in three areas than the student novices in the same levels and 2) both student experts and novices in upper high schools showed higher scores in three areas than the student experts and novices in lower high schools. The three areas were 1) domain - specific knowledge including conceptual knowledge and procedural knowledge 2) problem-solving process including problem understanding, problem representation, planning, performing, and checking, and 3) metacognitive knowledge in person, task, and strategy.

The interactions between expertise and class effected on knowledge in keyword, problem sorting, problem understanding, checking, metacognition knowledge intask and in strategy.