Investigation on Difficulty Components on Computerized Problem-Solving Assessment

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Problem solving has become a central educational objective in many countries' school program nowadays. The competency of problem solving includes a lot of cognitive operations that correlate to future learning, effective encountering and overcoming obstacles, even adapting the self to new conditions, such as community or society. In this study, a problem solving difficulty components model was proposed and verified. A computerized problem-solving assessment was developed according to the specifications of structure on, content and cognitive aspects. There were 1724 7th and 8th graders of Taiwan sampled for this investigation. Generally speaking, this assessment was very new and difficult for most 7th and 8th graders. The results suggested that six components accounted around 67% variance on item difficulty. The component of disclosure of information revealed relatively stronger impact on item difficulty. On the other hand, simulation could help students to solve the problems. The effects of grade and gender were both minor but statistically significant. At last, basing upon the cognitive component model, the performances of students was classified into four levels. In other words, the proposed model can also provide useful information for integrating problem solving competency into regular classroom teaching.