# THE CONSTRUCTION AND VALIDATION OF THE SCALE FOR EXAMINING SECONDARY SCHOOL STUDENTS' SELF-REGULATION OF MATHEMATICS LEARNING

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A new mathematics curricular guideline was initiated in 2019 in Taiwan to promote the next generation's mathematical literacy and self-regulation of mathematics learning (SRML). It is the first time that the math curriculum emphasizes developing students' SRML in Taiwan. However, the impact of the reformed curriculum on students' SRML is unclear because the term has not been well-defined and the lack of a valid and reliable instrument. Thus, this study constructed a scale to measure SRML and validated it to address the issue.

The conceptual framework of self-regulation of learning (National Academies of Sciences, Engineering, and Medicine, 2018) guided the construction of the SRML scale. The construction began with consulting math professors, curriculum guideline committee members, evaluation specialists, and school math teachers to define SRML. Then the items of the scale were developed based on the definition. Next, the experts were asked to rate the appropriateness of the items, and the content validity indices were applied to select items. Finally, 70 items passed the examination of content validity for further analysis.

Subsequently, the researcher administered the items to 865 secondary school students online for item analysis and to examine the construct validity and reliability. He received 861 valid responses and filtered these items by checking the item-remainder coefficient and the critical ratio. Items that passed the examinations were taken for conducting exploratory factor analysis (EFA). EFA suggested that the SRML scale consists of 64 items and four subscales: learning motivation, learning strategies, learning regulation, and learning resource management. In addition, the Cronbach alpha coefficient of each dimension of the subscales was above .70, which indicated that the SRML scale has acceptable internal consistency.

In sum, the scale is a valid and reliable instrument for examining the impact of implementing the reformed math curriculum on Taiwanese students' SRML. The process of constructing the scale help clarify what SRML means in the context of curricular reform. The process and product of the study expect to contribute to the implementation and improvement of the new math curriculum.

## References

National Academies of Sciences, Engineering, and Medicine (2018). *How people learn II: Learners, contexts, and cultures*. The National Academies Press.