

## THE PROFILE OF HIGH SCHOOL STUDENTS' PROBLEM-SOLVING ABILITY IN INDONESIA

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Problem-solving skills have been assessed in many countries since PISA launched the assessment of cognitive and cooperative problem-solving (OECD, 2014, 2017, 2019). In some countries, such as Indonesia, which have not participated in the global problem-solving assessments, students' proficiency level in problem solving are unknown. This study examined high school students' problem-solving abilities in Indonesia, involving 1,243 10<sup>th</sup> grade students (male: 36.8%, female: 63.2%) with the average age of 16.78 years ( $SD = 0.98$ ), who participated voluntarily. The problem-solving assessment was done with the MicroDYN test for domain-general problem solving assessment and with the science problem solving (SPS) test for domain-specific problem solving assessment. The MicroDYN test is composed of two main phases, knowledge acquisition and knowledge application, which are applied in ten items each (Greiff, 2012; Schweizer et al., 2013). The science problem-solving test consists of two main categories, identifying problems with five items and generating solutions with six items. The scoring is dichotomous, where the correct answer is assigned 1 point and the incorrect answer 0 point. Data analysis was performed with SPSS and Winstep software. The results showed that both the MicroDYN test ( $r\alpha = 0.85$ ,  $r\omega = 0.86$ ) and the science problem-solving test ( $r\alpha = 0.73$ ,  $r\omega = 0.73$ ) have good reliability values. We conducted confirmatory factor analysis (CFA) to assess the test's construct validity with 2-factor resulting in acceptable results for the MicroDYN (CMIN/df = 1.98, CFI = .99, TLI = .99, RMSEA = .03, and SRMR = .08) and the SPS test (CMIN/df = 1.99, CFI = .98, TLI = .98, RMSEA = .03, and SRMR = .04). A further Rasch analysis was performed for individual items resulting in good infit MNSQ values ranging from 0.67 to 1.36 for the MicroDYN and from .81 to 1.24 for the SPS test. The students' ability in each measurement's category and its distribution was evaluated based on the person logit value generated from the Rasch measurement (Boone et al., 2014). In domain-general problem solving, the students' mean logit value was -3.93 ( $SD = 1.80$ ). A comparison of genders showed that boys performed better than girls on the domain-general problem-solving test ( $t = 5.18$ ,  $p < .001$ ). On the science problem-solving test, the average level students reached was -0.88 ( $SD = 1.43$ ). In contrast to domain-general problem-solving, there was no difference between boys' and girls' abilities ( $t = -1.39$ ,  $p = .166$ ). This result reveals that students perform better in domain-specific problem-solving, depending on knowledge and context, than in the domain-general. Meanwhile, boys performed better than girls in the domain-general problem solving task. This result supports the PISA results of boys generally outperforming girls in creative problem-solving (OECD, 2014).