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Revisiting the scientific habits of mind scale for socio-scientific issues in the Indonesian context

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ABSTRACT

The purpose of this study was to develop a valid and reliable scale measuring the Indonesians' scientific habits of mind (SHOM) levels via the SSIs in context. The sample of the study consisted of 658 Indonesian people (aged 18–68 years; 385 females and 273 males; mean age: 35.5) randomly drawn from 3 districts of Special Region of Yogyakarta, Indonesia. To ensure content validity, the researchers matched SHOM (mistrust of arguments from authority, open-mindedness, scepticism, rationality, objectivity, suspension of belief, and curiosity) with the SSIs in the Indonesian context. A group of experts and a pilot study with 10 lay people ensured face validity. Concurrent validity was verified via independent samples t-test. To confirm convergent and discriminant validity, confirmatory factor analysis, and reliability values were calculated. Because the final version (33 items) of the SHOM scale has high validity in content, face, convergent, discriminant, and concurrent, it provides valid conclusions based on the theoretical constructs for the sub-scales. This suggests that the SHOM scale may be adapted or improved for SSIs in different contexts.

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KEYWORDS
Indonesian context; scientific habits of minds; scientific literacy; socio-scientific issues

Introduction

Since the 1980s, a 'science for all' slogan has influenced all science curricula in developed, developing, and underdeveloped countries (i.e. Çalik & Ayas, 2008; Fensham, 1985) and has appeared the term 'scientific literacy.' Although scientific literacy is multidimensional and involve several features/issues (i.e. a sound/conceptual understanding of science topics/phenomena, an awareness of the complex relationship among science, technology, society, and environment; scientific attitudes, nature of science, socio-scientific issues, scientific habits of mind, and twenty-first century skills) (Coll, Taylor, & Lay, 2009), its principal purpose is to equip learners/people with critical and scientific thinking about 'what, how and why of science?' (Çalik & Cobern, 2017; Ebenezer, Chacko, Kaya, Koya, & Ebenezer, 2010). Because most students do not follow a science track or a science career, school science courses, at least, should make them scientifically literate for responding to or making decision regarding science-related issues.

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