

Future Academy®'s Multidisciplinary Conference

Development of Multidimensional Construct Map of Responsible Citizenship of Lower Secondary School Students

Mesa Nuansri^a, Kamonwan Tangdhanakanond^{b*}, Shotiga Pasiphol^c

^a Ph.D. Student, Department of Educational Research and Psychology, Chulalongkorn University, Bangkok 10330, Thailand

^b Assistant Professor, Department of Educational Research and Psychology, Chulalongkorn University, Bangkok 10330, Thailand

^c Associate Professor, Department of Educational Research and Psychology, Chulalongkorn University, Bangkok 10330, Thailand

Abstract

A core principle of construct modeling is that assessment design should begin not with item creation, but with the development of a construct map. The purpose of this research was to develop and investigate a multidimensional construct map of responsible citizenship of lower secondary school students with high construct validity and reliability. Samples were 300 lower secondary school students in Thailand. Research instrument was a multidimensional responsible citizenship scale for lower secondary school students. Data were analyzed by using descriptive statistics, and multidimensional item response theory. Findings were as follows: 1) The multidimensional construct map of responsible citizenship of lower secondary school students comprised of three dimensions, i.e., knowledge, skill and attitude. The knowledge dimension consisted of 4 levels (i.e., Definition, Description, Analysis, and Evaluation). The skill dimension consisted of 3 levels (i.e., Imitation, Participation, and Role Model). The attitude dimension consisted of 3 levels (i.e., Perception, Value, and Conscious), respectively. 2) The multidimensional responsible citizenship scale consisted of three dimensions according to the multidimensional construct map. The EAP reliability of scale were .954, .901, and .895, respectively, whereas the construct validity of scale were supported by responsible citizenship model of multidimensional approach (RCMMA). The RCMMA ($G^2 = 21107.469$, $AIC = 21287.469$) was better fit than that of the composite approach ($G^2 = 21381.444$, $AIC = 21551.444$).

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Peer-review under responsibility of Future Academy® Cognitive Trading

Keywords: Construct map, responsible citizenship, multidimension

* Corresponding author. Tel.: +6-686-814-9388 Fax: +662 218 2801
E-mail address: tkamonwan@hotmail.com

1. Introduction

When we rely upon gains on some measure to support statements of prescription, we have the obligation to ensure that those measures are valid. A core principle of construct modeling is that assessment design should begin not with item creation, but with the development of a construct map. Construct maps are representations of models of cognition by which the results of the assessment can be interpreted. Without construct maps in place from the beginning, assessment designers are handicapped with a largely implicit model of cognition and no clear guidance for item developers on how to create assessments with construct validity (Brown & Wilson, 2011). In this paper we illustrated the usefulness of a multidimensional approach to measurement with the Multidimensional Random Coefficient Multinomial Logit (MRCML) model, an extension of the unidimensional Rasch model. The potential usefulness of multidimensional item response models has been recognized for many years and there has been considerable recent works on the development of multidimensional item response models and, in particular, on the consequences of applying unidimensional models to multidimensional data, both real and simulated (Ackerman, 1992; Embretson, 1991; Folk and Green, 1989; Reckase, 1985; Reckase and McKinley, 1991; Walker and Beretvas, 2000).

Responsible citizenship involves the determination to act in the best interest of human and ecological communities, for social, environmental, and economic benefits. Ethical decision-making requires an understanding that one's actions have both direct and indirect effects on humans and environments, and acting conscientiously to support societal movement toward a sustainable future. Moreover, influencers can help youth feel connected to political systems, and help to promote the view of youth as active and contributing members of their communities. The related literatures indicated that the responsible citizenship was comprised of three dimensions, i.e., knowledge, skill and attitude, as the multidimensional latent variable. Many constructs are more complex than unidimension; therefore, construct map approach is appropriate to measure the multidimensional latent variable. (Wilson, 2005) The purpose of this research was; therefore, to develop and investigate a multidimensional construct map of responsible citizenship of lower secondary school students with high construct validity and reliability.

2. Method

2.1 Participations

Data were collected from 300 lower secondary school students (grade 7-9) in the schools under the jurisdiction of the Office of Basic Education Commission of Thailand in the 2015 academic year. Samples were selected by multi-stage random sampling from all regions (north, middle, northeast and south) of Thailand. This number of students was comprised of 137 male and 163 female students.

2.2 Instrument

Research instrument was a multidimensional responsible citizenship scale for lower secondary school students comprised of three dimensions, i.e., knowledge, skill and attitude. The knowledge dimension consisted of 4 levels (i.e., Definition, Description, Analysis, and Evaluation). The skill dimension consisted of 3 levels (i.e., Imitation, Participation, and Role Model). The attitude dimension consisted of 3 levels (i.e., Perception, Value, and Conscious), respectively. The EAP reliability of scale were .954, .901, and .895, respectively.

2.3 Data Analysis

Student's responsible citizenship on these assessments is multidimensional in nature, but can also be treated as consecutive unidimensional estimates, or as is most common, as a composite unidimensional estimate. Structural parameters were estimated for each model using ConQuest, and model fit was compared. Student behavior in responsible citizenship was also compared across models with fit statistics including Akaike information criterion (AIC), and deviance index (G^2).

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