

Geometry Literacy Scale: Construction, Validity, and Reliability

Yasemin KATRANCI¹, Sena YILDIZ²

Kocaeli University, Faculty of Education, Department of Mathematics and Science Education,
Turkiye¹,

Inonu University, Faculty of Education, Department of Mathematics and Science Education,
Turkiye²

Abstract

In this study, we aimed to develop a geometry literacy scale for pre-service middle school mathematics teachers. Within the scope of this aim, the paper was a scale development study and 865 pre-service middle school mathematics teachers at Education Faculties in Turkiye participated in the study. To analysis, the participants were divided into two groups. First one consisted of 432 pre-service middle school mathematics teachers, second group consisted of 433 of them. The data from the first group was used for exploratory factor analysis and the data from the second group was used for confirmatory factor analysis. The reliability analyses for all the groups were calculated. As a result of exploratory factor analysis, the Geometry Literacy Scale with 32-items (36.592% of the explained total variance) and single factor structure was developed. The Cronbach alpha coefficient of the data from the first group was calculated as 0.942. After this, a confirmatory factor analysis was executed with these 32-items. According to this analysis, the results ($\chi^2/df= 5.78$; RMSEA= 0.10; RMR= 0.06; SRMR= 0.06; CFI= 0.95; IFI= 0.95; NFI= 0.94; NNFI= 0.95) confirmed the scale structure and its items. The Cronbach alpha coefficient of the data from the second group was calculated as 0.943. Therefore, a valid and reliable scale regarding geometry literacy for pre-service middle school mathematics teachers was developed.

Keywords: factor analysis, pre-service teachers, mathematics, middle school, scale development