Nanoscale Science Teaching in Informal Settings: the Development of Theoretical Model of Situational interests and Individual Interest

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This study explores which type of nanotechnology instruction presentation promotes students' learning interest. We established a new program entitled "Integrating Nanotechnology into K-12 Science Curriculum (INSC)" to assess students' individual interest and situational interest in various academic settings at the Science and Technology Museum in Taiwan. Additionally, we designed a "Learning Interests Questionnaire," which was administered pre and post test. The sample consisted of 99 high school students, 110 secondary school students, and 98 primary school students from southern Taiwan. Data were analyzed using t-tests and structural equation modeling (SEM) for evaluating the fit of the proposed 4 model and estimating path coefficients of 3 latent variables (i.e. triggered-SI, maintained-SI and individual interest). The results indicated the following: (1) Students' triggered-SI and maintained-SI both increased significantly across different academic settings. In particular, the high school students exhibited the largest growth in the maintained-SI-value. (2) Among the 4 proposed models, the nonrecursive model fit the observed data quite well, situational interest was statistically significant predictor of change in individual interest across the school year. Then, the maintained-SI is also affected by the students' triggered-SI and their individual interest. (3) We assessed the fit of each model with the scaled $\chi 2$ statistic, the standardized root mean square residual (SRMR), and the comparative fit index (CFI). Those above indicators stated goodness of fit of SI-II nonrecursive model. (4) the primary school students exhibited more individual interest than secondary school students. Among primary, secondary and high schools, the indirect effects of triggered-SI on individual interest were .61, .58 and .42. (5) The direct effects of maintained-SI on individual interest were .87, .73 and .86. Besides, The direct effects of individual interest on maintained-SI were .31, .26 and .56. Based on these study's findings, the implications for practice and theory are discussed.