Meta-analysis of the variables related to the success of Iranian students in international studies TIMSS test

Behzad rasoolzadeh[1]

Abstract

The main objective of this study measured the effect of variables related to student achievement in TIMSS in Iran. The method of the present research was a meta-analysis type. The use of internal and external databases to find and report-research gathering all the action. Sample case studies included 13 studies from 2011 to 2023 across Iran. Data from the 13 studies using fixed effects model meta-analysis of the effect of Pearson's correlation coefficient was used. Statistical analyzes were performed using the second edition comprehensive meta-analysis software. Results showed that the overall effect size for the fixed effects model 0/605 to 0/597 against both random effects are significant at 0/001. The quality of teaching teachers, gender, motivation, educational activities at school, school curricula, self-concept, socioeconomic status, the relationship between parents and schools, attitudes, teach thinking skills, school climate, school and family history with the success of students TIMSS there is a significant effect size.

Keywords: meta-analysis, students, achievement, TIMSS, effect size

1.Assistant Professor, Education Distance Planning, Payame Noor University,Tehran, Iran (behzad.52bn@gmail.com)

Introduction

One of the most famous comparative studies conducted by the International Institute for the Evaluation of Educational Success is the Fourth International Study of Mathematics and Science Education (timss) (Glassow et al., 2023). In Iran, so far, many researches have been carried out to describe and compare related factors or factors affecting the success of students in the international timss test, or they have discussed theoretical issues in this field. Some of these studies have investigated the relationship between individual factors and family factors with success in the TIMSS test (Ahmadi & Moaini, 2012; Pahlevansadiq & Kajbaf, 2013; Taghbian & Moghadamzadeh, 2014). Some of these other studies have been conducted in order to investigate the relationship between school factors and success in the timms test (Naqsh & Moghadam, 2011; Kasiani & Zaraei, 2018; Negahban et al., 2019). According to the stated contents, the main goal of the current research is to meta-analytically examine all the internal researches in the field of variables related to students' success in the TIMSS test in order to review previous studies and combine their results.

Methodology

The present research method is meta-analysis type. In this research, first, by using the keywords of the International Mathematics and Science Test, the International Academic Progress Test and the TIMSS Test in domestic and foreign databases and various search engines to find and collect all the articles. Published in Farsi and English, the results of national and provincial researches, master's and doctorate theses, which somehow investigated the Teams test in Iran In this way, all the research's conducted between 2011 and 2023 were collected. According to the inclusion criteria of the researches in the meta-analysis as well as the evaluation results, 13 researches were selected and analyzed among the conducted researches. In order to perform statistical operations, meta-analysis software was used using effect size combination method.

Results

Table No (1) shows the meta-analysis of the studies of students' success in the TIMSS International Test based on 13 studies. The average effect size of the studies conducted in the field of variables related to students' success in the teams test is 0.605 for the fixed effects model and 0.597 for the random effects, both of which are significant at the 0.001 level.

Table 1. meta-analysis data of variables related to students' success in the TIMSS test

Studies	year	r	z	SE
Sarmadi et al	2011	0/47	0/531	0/052
Naqash and mogada	2013	0/67	0/834	0/061
Sadeg and kajbaf	2012	0/51	0/452	0/049

Minai	2014	0/74	0/853	0/059
kiamanesh	2014	0/52	0/468	0/053
Minai and ghfari	2016	0/80	1/135	0/046
Tagabi and mogad	2017	0/46	0/473	0/057
Jafari et al	2018	0/44	0/485	0/570
Ahmadi et al	2019	0/42	0/461	0/063
Kessani and zaree	2020	0/51	0/425	0/054
Soltani et al	2020	0/73	0/915	0/051
Negahban et al	2021	0/37	0/413	0/060
kabiri	2023	0/77	0/981	0/050

Table (1) Shows the confidence interval of the results of 13 studies for the TIMSS test. As can be seen in graph number (1), the effect size of all the studied studies are significant at the 0.95 level, and the average overall effect size of all 13 studies in the fixed and random model is significant at the 0.01 level. The highest effect size in these 13 studies is related to studies number 6 (1.135), 13 (0.981), 11 (0.915) and 4 (0.853), respectively.

Discussion and conclusion

The results showed that the high effect size of the self-concept variable on students' success in the TIMSS test is in line with the findings of (Glassow et al., 2023; Lou et al., 2016; Chiu & Klassen, 2010). The next variable that had a high and significant effect size with students' success in the teams test was family background. Also, the results of the research showed that educational activities in school are another important variable that has a high effect on students' success in the TIMSS test. As mentioned in the introduction and examined from different dimensions, success in the TIMSS test has a significant relationship with many variables. But unfortunately, the weakness of the researches conducted in various fields, including non-observance of methodological principles, made it impossible to use all the researches. Based on this finding, future researches can investigate other variables related to the success of students in the TIMSS test, factors affecting it, mediating variables, and such things.

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