

DISCOVER Problem Matrisi- nin Revize Edilmesi ve Psiko- metrik Özelliklerinin İncelen- mesi

An Investigation on the Revi- sion of the DISCOVER Prob- lem Matrix and its Psychomet- ric Properties

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Öz

DISCOVER Problem Matrisi (DPM) farklı türlerde problem geliştirmeye yarayan bir problem geliştirme modelidir. Matris iyi yapılandırılmış problemlerden iyi yapılandırılmamış problemler aralığında yer alan 6 problem türü içermektedir. Matris hem eğitim etkinliklerinin hem de üstün yeteneği tanılama ve değerlendirme araçlarının tasarlanmasında kullanılmaktadır. Bu araştırmada DPM, revize edilerek bir problem türü daha eklenmiş ve yeni matrisin psikometrik özellikleri incelenmiştir. Revize edilen matrisin yapısına uygun olarak hazırlanan ölçme aracı 519 ilköğretim öğrencisine uygulanmıştır. Ölçme aracının güvenilirliği .75 olarak saptanmıştır. Matristeki problem türleri arasında pozitif ve anlamlı ilişkiler bulunmuştur. Matris üzerindeki sıralamaya göre birbirine yakın problem türleri arasındaki ilişkilerin daha yüksek olduğu bunun yanında sıralamaya göre problem türleri arasındaki uzaklık arttıkça ilişkilerin genelde azaldığı görülmüştür. Bu araştırma kapsamında revize edilen matrise eklenen problem türünün diğer problem türlerine uyum sağladığı da elde edilen bulgular arasındadır.

Anahtar Sözcükler: DISCOVER Problem Matrisi, problem türleri

Abstract

DISCOVER Problem Matrix (DPM: Discovering Intellectual Strengths and Capabilities through Observation while for allowing Varied Ethnic Responses) is a problem continuum model that can be used for developing and assessing problem solving skills in domains of ability and knowledge. The DPM includes six problem types from well-structured to ill-structured types. Because it is a problem continuum, more types can be added to the Model. A measurement instrument was developed based on the revised Matrix and administered to 519 seventh and sixth grade students. The instrument was found to have a reliability coefficient of .75. Statistically significant correlations were found between the problem types. The more distant two problem types are from each other, the lower the correlation between them, and the closer the problem types are to each other, the larger the correlations between them, which is a fact that provides evidence for the validity of the Matrix. Furthermore, the new problem type added to the Matrix was found to have a good fit with the structure of the Matrix.

Key Words: DISCOVER Problem Matrix, problem types.

Summary

Purpose and significance: According to the DPM, problems can be categorized according to whether the problem, method or solution is known by the presenter and/or the solver. The DPM includes six problem types. But it is a continuum model so more types can be added to the Matrix. The purpose of this study was to

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search new problem possibilities to integrate into the DPM and to investigate the psychometric properties of the revised DPM.

Method: Participants included 519 students from 10 schools. Of the total sample, 248 were 6th graders (141 female; 107 male) and 271 were 7th graders (154 female; 117 male). In the first stage of the research study, the DPM was reviewed and a new problem type was added to the DPM. Next, a measurement instrument was developed according to the revised DPM (r-DPM). The instrument was administered to the participants to investigate its psychometric properties.

Results: Reliability coefficient was found to be .75. For the validity of the r-DPM, expert's views were used, correlations between problem types were examined and grade discrimination was investigated. Positive and statistically significant correlations were found between the problem types. Parallel to previous research, the more distant two problem types are from each other, the lower the correlation between them, and the closer the problem types are to each other, the larger the correlations between them, which is a fact that provides evidence for the validity of the Matrix. Seventh graders had higher scores than the sixth graders on the instrument.

Discussion and Conclusions: The DISCOVER Problem Matrix (DPM) can be used as a theoretical framework to develop instruments for measuring problem solving skills related to different intellectual abilities as well as educational activities and tasks to develop these skills. It has been used in the assessment and education practices in gifted education. The current study extended previous studies about the DPM and provided additional evidences related to its reliability and validity. Results of the study showed that the DPM has sufficient convergent and divergent validity because the more distant two problem types are from each other, the lower the correlation between them (discriminant validity), and the closer the problem types are to each other, the larger the correlations between them (convergent validity). These findings are parallel to those obtained by Sak and Maker (2005). The new problem type added to the Matrix also had a good fit with the structure of Matrix. Furthermore, evidence also was obtained in terms of the Matrix's discriminant validity. That is, 7th graders scored higher than the 6th graders on the Matrix-based instrument. This study provided research evidence about the reliability and validity of the revised DISCOVER Matrix. Because, it's a problem continuum model, more problem types should be added to the Model.