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Validation of Physics Standardized Test Items

JILL MARSHALL, University of Texas

The Texas Physics Assessment Team (TPAT) examined the Texas Assessment of Knowledge and Skills (TAKS) to determine whether it is a valid indicator of physics preparation for future course work and employment, and of the knowledge and skills needed to act as an informed citizen in a technological society. We categorized science items from the 2003 and 2004 10th and 11th grade TAKS by content area(s) covered, knowledge and skills required to select the correct answer, and overall quality. We also analyzed a 5000 student sample of item-level results from the 2004 11th grade exam using standard statistical methods employed by test developers (factor analysis and Item Response Theory). Triangulation of our results revealed strengths and weaknesses of the different methods of analysis. The TAKS was found to be only weakly indicative of physics preparation and we make recommendations for increasing the validity of standardized physics testing..