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Abstract
The quality of item focuses on the result of item analysis. According to quantitative indices such as difficulty index, discrimination index etc., it can not know that what kind of ability of examinees can be evaluated by items. So the investigation from Trends in International Mathematics and Science Study (TIMSS) usually uses the method of scale anchoring to distinguish different levels between items, and inquires the abilities and skills needed on solving different level's items. Because traditional scale anchoring only selects few several scores to be anchor points, the result of item classification will be rough but not precise. In addition, the method of using competence indicator to describe the abilities and skills of solving items is abstract and inexact.
Therefore, in this thesis, we first improve the scale anchoring and propose the arbitrary smoothing method for representing the items' level by all possible score points of scale. Thus, we can distinguish the items' level more precise and show the meaning of items' level by corresponding to the same scale of scores. Additionally, three dimensions' classification index describing items' function more concretely is then proposed based on the revised Bloom's cognitive taxonomy. As the items in these analysis procedures possess precise and concrete characteristic data, an item knowledge base system, IKBS, is finally implemented, combining teaching material's knowledge and items.
The results of this research are illustrated as follows: items can be classified more precise by the arbitrary smoothing method and the index of scale anchoring possesses double meanings of the difficulty of item and the score of examinee; the model of three dimensions taxonomy cube according to revised Bloom's cognitive taxonomy can concretely describe the features of evaluation of item; the item knowledge base system can supply important reference for teacher's proposition and student 's adaptive learning.
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