A Study on the Item Selection Strategy for Achievement and Diagnosis Tests

鍾啟文、邱瑞山

E-mail: 9707434@mail.dyu.edu.tw

ABSTRACT

In the past, achievement tests and diagnosis tests are usually carried out separately. Since achievement tests must take into account the principle of fairness, the time limit and items chosen in a test for each student must be the same. However, in an adaptive item selection strategy, the next test item is chosen according to the previous test result of a student; hence, the test items chosen for each student may be different. Thus, it is difficult to apply an adaptive item selection strategy on achievement tests. Moreover, if we carry out achievement tests and diagnosis tests separately, in addition to add to the burden of students and teachers, whether students can spontaneous use diagnosis system to the test could be also a concern. Accordingly, the study is to combine achievement tests and diagnosis tests. Through one test, in addition to assessment of the effectiveness of learning, it can be also to diagnose the test results, identify misconceptions of individual students, for the follow-up remedial guidelines. A Greedy Item-Selecting Algorithm （GISA） is proposed to achieve both the assessment of learning effectiveness and diagnosis of misconceptions, by taking into account the fairness of the test also, with lesser number of items. Experiment shows that the test results obtained with lesser items in our approach are close to the test results obtained with full items. In addition, the chosen items can be used to diagnose most of the concepts. Our approach can be effective for saving lots of time.

Keywords : Misconception ; Item-Selection ; Learning Diagnosis

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