

# Innovative Approaches to e-Assessment: Possible Answers to the Guessing Problem in Multiple Choice Tests

*Lenka Belanova, Hynek Cigler*

[belanova@mail.muni.cz](mailto:belanova@mail.muni.cz), [hynek.cigler@mail.muni.cz](mailto:hynek.cigler@mail.muni.cz)

*Faculty of Social Studies, Masaryk University, Brno, Czech Republic*

Computerized testing has considerable potential not only to ease assessment load, but also to provide innovative and powerful modes of assessment. While the steady pressure for the use of more sophisticated question types in e-assessment is present, Multiple Choice (MC) is still the most frequently used question type. The conventional scoring method for MC tests is Number right, where the item score is based solely on the alternative selected by the examinee: full marks are given for the correct answer, zero points for the wrong or no answer.

The goal of assessment is to accurately measure students' true ability. Nevertheless, under the Number right scoring scheme, the test evaluator cannot distinguish between correct answers based on knowledge versus those derived from a lucky guess. Since guessing adds random error to the variance of test scores and decreases both reliability and validity, it is a main factor to consider when attempting to improve MC tests.

Several possible solutions to the guessing problem have been developed (in the CTT framework) and can be grouped into three main categories: Correction for guessing (also called Formula scoring), Confidence weighting (with Certainty-based marking scheme as its special case), Probability measurement. We present in detail the rationale of their scoring schemes as well as their advantages and disadvantages, and illustrate their psychometric properties on model data.

While Probability measurement is the most appealing method from the psychometric point of view, the implementation of Certainty-based marking scheme into computerized multiple choice testing seems to be the most feasible choice. Its contribution to the increase of both reliability and validity has been shown, the formative potential has been advocated, while the marking scheme is still fairly simple and comprehensible to both students and teachers.