

STUDY MAPS AS A TOOL FOR THE ADAPTIVE TESTS CONSTRUCTION

Chapter 1

Number of university students is very high in some courses. Verification of their knowledge cannot be made by an oral examination and similar time-consumption methods, hence computer aided testing is used very often. Questions that can be processed by the computer itself are used in the computer tests, these questions are composed from the taught curriculum selection by qualified teachers. But this composing process has not a systematic support and an appropriate balancing of the share of parts and difficulty. Thus, results obtained from these tests usually does not represent required explanatory power. The test result is often depicted as an amount of points and student obtains appropriate mark on this point basis. We detect some principal questions in this context: What knowledge, however, such a mark match? Have two students with the same score the same knowledge? Is it possible to get passed mark, even if a student's knowledge is insufficient? These problems were discussed in many articles with many points of view. For example, prof. Vaníček (1999) says: ...numbers (marks) do not reflect any operation of composition in the real world. There even is not any empirical justification between particular grades. The difference between 3 and 4 is a difference between success and fail, the difference between 1 and 2 is a different intensity of a complementary praise to the success in passing the exam. If we calculate an arithmetic mean from the grades, we gain a number that has no meaning in an empirical world. 1 This cite from a year 1999 sums up one of topics of our research and this paper – the topic is finding an answer and a possible solution on a question – is one number (grade) able to describe student's knowledge? Especially when the number was obtained from a computer assisted test with closed questions? In 2012 a preliminary pedagogical experiment of comparing a computer assisted test (with closed questions) with an oral exam was performed. The goal was to get an objective prove that the results of this kind of test doesn't provide an appropriate information about student's knowledge. Simultaneously we wanted to gain a proper foundation for a design of a computer assisted adaptive test competing with the drawbacks of currently used regular computer assisted tests. Hand in hand with this goal goes another need – a design of a representation of the results of the test depicting structure of student's knowledge verified by the test. Objective of this paper is to describe results of this pedagogical experiment and to introduce a proposal of a method for computer adaptive testing with a focus on knowledge of context.

MATERIALS AND METHODS

The experiment was performed within a university course Informatics for Economists II (Informatika pro ekonomy II, an abbreviation IPE2 is used in following text) taught at Faculty of Business and Economics (FBE) and within a course Informatics in Agribusiness (Informatika v agrobyznysu, INAGB) taught at Faculty of Agriculture (AF), both at Mendel University in Brno (MENDELU) during the summer semester 2011/2012. Goal of the experiment was to intercept the difference between "classic" computer based test (computer assisted test with closed

questions) and an oral exam. The experiment was performed on 90 tests and it consisted of a written computer test and of a following oral exam. Written computer assisted test was performed via an e-learning application in a University Information System of Mendel University (UIS). The test from the course IPE2 is a test with 25 closed questions of different types: dichotomous questions, ordering questions, multiple choice questions with one or with more correct answers. Main condition of this test construction was computer evaluation without an intervention of teachers, because these courses are studied by very large number of students. This condition excludes the use of more complex or open questions. The whole test is divided into five thematic modules; at least 50% from each module is necessary to pass the test (the reason for their implementation is described in details in Haluza, Talandová, 2009). Guessing correction is implemented in the test, i.e. wrong answers are penalized with negative amount of points. This amount is proportional to the probability of guessing the correct answer. Test from the course INAGB is a test with 17 closed questions of different types, no division into modules is implemented here, guessing correction is used, the minimum to pass the test is 50% (after recalculation due to the guessing correction).