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METHODOLOGICAL FEASIBILITY OF TEST TECHNOLOGIES IN ASSESSING MEDICAL STUDENTS' PROFICIENCY*

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The paper is focused on the issues associated with implementation of test assessment methods in the educational process of higher medical educational institutions. The objective of the research is to develop the cycle of test assignments and provide methodological recommendations for their integration in higher medical education. The article examines the advantages of using test methods as compared to the traditional ones for assessment of learning outcomes at higher medical educational institutions (the minimum time expense for performance and checking the results; the possibility of checking the quality of mastering knowledge in both theoretical and practical material; diversification of the learning process). It has been shown that such methods promote the cognitive activity of students and help in shaping the professional competence of future doctors. The authors have justified the methodological algorithm for the suggested system of tasks. The proposed cycle of test tasks is aimed at improving the knowledge, skills and abilities of medical students. Targeted and methodically thought-out work with test assignments at higher medical educational institutions is one of the effective ways of forming the competence of future specialists in the field of medicine and healthcare. The prospects for study consist in further in-depth research of the potential of test methodology in assessing the learning outcomes of medical students.

Key words: test, test control, assessment, learning outcomes, methodology.

У статті обґрунтовано доцільність впровадження методик тестового контролю у навчальний процес вищих медичних навчальних закладів. Мета дослідження – розробка циклу тестових завдань та надання методичних рекомендацій щодо їх реалізації у вищій медичній освіті. Розглянуто переваги застосування тестових методик у порівнянні з традиційними технологіями контролю результатів навчання у вищих медичних навчальних закладах (мінімальні витрати часу на виконання та перевірку результатів; можливість перевірки якості засвоєння знань як теоретичного, так і практичного матеріалу; диверсифікація навчального процесу). Авторами запропоновано методологічний алгоритм впровадження технології тестового контролю. Розроблений цикл тестових завдань спрямований на вдосконалення знань, умінь і навичок студентів-медиків, розвиток пізнавальної активності та формування професійної компетентності майбутніх лікарів. Методично продумана робота з тестовими завданнями з урахуванням потреб цільової аудиторії у вищих медичних навчальних закладах є одним з ефективних способів формування компетенції майбутніх фахівців у галузі медицини та охорони здоров'я. Перспективи дослідження полягають у подальшому поглибленому дослідженні потенціалу методології тестування при оцінці результатів навчання студентів-медиків.

Ключові слова: тест, тестовий контроль, оцінювання, результати навчання, методологія.

Since 2005, Ukraine has joined the Bologna Process, which anticipated significant transformations in the national education system. The first requirement for higher education today is orientation towards the development of an individual who is capable of solving professional issues and socio-economic problems in their interrelationship. Accordingly, gradual changes in the national system of higher education are observed. An important step on this path should be the introduction of qualitatively new approaches to assessing students' proficiency. The educational process at higher medical educational institutions today largely shifts the emphasis on student's self-directed study. Monitoring and evaluation of students' knowledge is an important problem in the theory and methodology of teaching and one of the main parts of the learning process. The assessment should meet certain requirements and must be objective, systematic, educational, diagnostic, formative, managerial, developmental, evaluative, comprehensive, as well as covering all parts of the educational process and promoting its de-

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velopment and improvement. Over time, the forms and methods of assessing the students' proficiency change, but their aim remains the same – namely, the objective verification of the level of acquired knowledge, stimulation of systematic self-directed work and cognitive activity of students, evaluation of the effectiveness of self-directed and individual work of students, their ability to work with educational, reference, methodical literature. In this context, of particular importance are methods for assessment of learning outcomes, and thus the issues of using and developing the test methods of control are relevant.

The aim of the research is to provide theoretical substantiation for feasibility of test assignments, to determine their methodological peculiarities in the setting of higher medical educational institutions, and to develop the relevant guidelines for the implementation of test control techniques in higher medical education. We will provide the system of test tasks, focused on assessing the students' level of mastering the training material and substantiate the didactic purposes of each suggested test task.

The methodology for assessment of learning outcomes has already been extensively studied [1; 4; 5; 6; 8; 10]. It should be noted that traditional methods for proficiency assessment are sometimes rather out-of-date, since they are often subjective and do not involve the reconstructive and creative levels of mastering the knowledge. Current and periodic types of assessment are very important and teachers often encounter difficulties associated with their implementation. Most often, difficulties arise due to the following features of teaching work:

• impossibility of assessing the comprehensiveness of mastering the material in large groups of students (checking only by formal criteria);

• teacher's workload with routine checking of students' papers, development of didactic materials during a short period of time;

• possible bias of the teacher;

• mismatching requirements of different teachers to assess students' knowledge;

• distorted credibility of proficiency assessment due to students' cheating.

Traditional check-up of learning outcomes stimulates academic activity of students, but does not fully satisfy with professional and scientific needs, required by the modern society. It is necessary to point out that assessment of students' learning outcomes in higher medical and pharmaceutical education is particularly important, since medical errors can harm the human life and health. Consequently, it is necessary to introduce a system for monitoring with maximum objectivity and possibility of measuring the assessment using the qualitative and quantitative indicators. In recent years, test techniques have become widespread, as one of the forms of assessing the learning outcomes. A test is a standardized, often time limited assignment, intended to measure the respondents' knowledge and abilities [2]. The test tasks are based on special training material, which has undergone the experimental validation and contributes to the objective assessment of the level of the acquired knowledge.

When preparing the test tasks, it is important to keep in mind that test results should be reliable and unambiguous. Moreover, it is necessary to bear in mind that test methodology for assessing proficiency is a complex process that involves the preparation of didactic material, taking into account the psychological characteristics of students, its analysis and unification. When compiling the test tasks, it is necessary to take into account the following aspects:

• a test should not target only advanced students or non-achievers;

• the teacher should not influence the assessment results;

• the number of tasks in the test block should be proportional to the share of the topic in section;

• a test should not be overloaded with secondary terms and statements;

• test tasks should not focus on mechanical memorizing (accurate reproduction of the structure of the material from the textbook), etc.

The effectiveness of test methods for assessing students' knowledge also depends on the compliance with psychological and pedagogical requirements for their application: it is necessary to implement the test techniques gradually, maintain organizational clarity in conducting test assessment (determining the time to complete the task, adequate explaining the test tasks, providing each student with a standard response form), and provide the compulsory analysis of test results.

Taking into account the given methodological recommendations and features of the curriculum, the teacher must adequately select the form of test tasks. In the setting of higher medical educational institutions, where the priority task is the formation of professional competence [3; 7], we consider it appropriate to use the following types of test tasks:

• open test tasks with multiple choices;

• test assignments for identifying the correspondences;

• test assignments for matching parts;

• test assignments for completion of statements;

• tasks for contrasting or comparing;

• task for reproduction of the correct sequence;

• tasks for reconstitution of parts;

• alternative response (closed test tasks);

• creative tasks which require additional self-directed study of the training material.

In higher medical education, it is recommended to use open and closed forms of test tasks [8]. The closed form of test tasks involves the selection of one or more variants of the answer from several proposed ones. Such tasks make it possible to use time economically in class, to demonstrate the skills of logical mastering the training material, to achieve the unification of requirements to knowledge control. Blocks of such test tasks can be presented in different ways. It is justified to use test questions with four variants of answer [2]. Each task should start with a clear statement of the question. Next, it is necessary to form a complete correct answer and present it along with the unnecessary ones. It is advisable to use the closed-form test tasks, since they involve the reproduction of training material according to the principles of classification, cycling, cumulation; test tasks that involve the reproduction of the correct sequence of statements, establishment of causal relationship between phenomena, comparison or contrast.

Testing is both a training exercise and a means of control. The use of test tasks as a means of training is effective and justifiable from the point of view of didactics and psychology. The restricted time limit for testing procedure and availability of standard answers streamline the learning process, whereas the focus on active mental

activity and objectivity of the results create a positive attitude towards the subject which is being studied.

Nowadays, test methods for proficiency assessment are constantly changing and improving, blank testing is replaced by computers. An important methodological issue is the choice of adequate methods for test assessment of students' knowledge at medical universities.

In the process of developing professionally-oriented test tasks that ensure the level of professional knowledge of students, it is necessary to pay attention to the tasks that enable to assess the students' ability to use knowledge in practice, taking into account the interdisciplinary and cross-curriculum connections, the level of self-sufficiency in acquiring the knowledge. The examples of such tasks are as follows:

• formative assessment closed test tasks (simple multiple choice);

• retrospective tasks aimed at the practical mastering of educational material;

• original tasks for causal dependence, the conformity of parts, the reproduction of the correct sequence of parts;

• constructive tasks, which consist in adding several variants with one's own responses, which involves the self-directed processing of additional information by students;

• initiative tasks;

• task with a pre-included error or unnecessary information;

• graphic tasks that make it possible to classify the previous material and identify the skills of analysis and generalization in students.

The suggested test tasks allow to form a clear multilevel system of rating control and thus intensify the cognitive activity of students. Such tasks are feasible in terms of information technologies (computer testing), as well as traditional methods (blank testing).

The system of test tasks can be easily integrated with modern technologies (the *Test W-2* diagnostic system). It has a user-friendly interface available and allows to control and assess the knowledge both during lessons and in the process of retaking the missed classes. This system is time-saving and it eliminated the possibility of cheating on a test [9; 11].

The *Test-W2* test editor is actively used by teachers to assess students' proficiency. Among its advantages, it is also possible to distinguish the following:

• identifying the individual testing parameters (number of questions, testing time, etc.);

• the use the assessment scale with 2, 5, 6, 9 or 12 points;

• testing with diagnostics (in the process of testing, the correct and incorrect answers are indicated);

• protection of tests and testing protocol from unauthorized actions;

• operation in the local computer network.

In developing the test tasks, the following requirements should be taken into account: unambiguity, standartization, short duration, validity and convenience for check-up.

Further recommendations for developing the test tasks are:

• the wording of the question part in the task should be accurate, concise, unambiguous and understandable;

• the form of statement of test tasks should not change within one block of assignments;

• if a response involves a certain calculation procedure, then it should be simple and should not require the use of technical devices;

• test assignments are accompanied by one instruction to perform, which changes in case of changing the form of the test;

• the instructions, the question part of the test and the answer options should differ in font and color for better visualization.

At the same time, it should be noted that test assessment of proficiency (both blank and computer versions) does not provide sufficient communicative interaction between a student and a teacher, and therefore it sometimes may be subjective. Therefore, tests should not be the only method in the teacher's didactical arsenal and should not completely replace the communication-based assessment techniques. In other words, a reasonable combination of different assessment methods is essential.

Thus, targeted and methodically thought-out work with test assignments at higher medical educational institutions is one of the effective ways of forming the competence of future specialists in the field of medicine and healthcare. The testing method is recognized globally as a reliable and objective one. Its advantages are as follows: relative ease of implementation; the minimum expenses of training time and teacher's time to check the papers (testing is also referred to as "the express method"); the possibility of checking the quality of mastering the knowledge in both theoretical and practical material; diversification of the learning process as such; promoting the computerization processes of the learning process. Adequately selected forms of test tasks and appropriate didactic material can significantly reduce the time for proficiency assessment, and help the teacher to update the training course. The prospects for study consist in further in-depth research of the potential of test methodology in assessing the learning outcomes of medical students.

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