



Co-funded by the  
Erasmus+ Programme  
of the European Union



# HI3

HEALTH INNOVATION  
IMPLEMENTATION AND IMPACT

## HEALTH INNOVATION PROJECT

### **Health Innovation, implementation and Impact (HI3)**

- A functional training program on how to implement sustainable change in the health care system on a clinical level.

### **PEDAGOGICAL ASPECTS OF TRAINING HEALTHCARE PROFESSIONALS THAT WORK IN VARIOUS CLINICAL SETTINGS**

*Anna G. Faustova and Thomas Nilsen, Triskelion Norway*

*The content of this report does not reflect the official opinion of the European Union.  
Responsibility for the information and views expressed in the report lies entirely with the author(s).  
Contract number 2018-1-SE01-KA202-039066*



## CONTENTS:

<b>CONTENTS:</b>	<b>2</b>
<b>INTRODUCTION</b>	<b>3</b>
<b>CHALLENGES IN TEACHING HEALTHCARE PROFESSIONALS</b>	<b>5</b>
<b>THE OBJECTIVES OF LEARNING AND OUTCOMES</b>	<b>6</b>
<b>METHODS THAT CAN BE UTILIZED</b>	<b>12</b>
<b>EMOTIONAL DISTRESS</b>	<b>15</b>
<b>HEALTHCARE WORKERS AND PEDAGOGY</b>	<b>16</b>
<b>REFERENCES</b>	<b>19</b>

## Introduction

Summarizing the trends in contemporary medical education in the USA and the EU, we may mention the following (*Custers & ten Cate, 2018; ten Cate, 2014*):

- The active debates regarding the amount of required academic hours, especially when it comes to practice at clinics and hospitals;
- The ideological opposition between the theoretical-oriented and practice-oriented approaches to train healthcare practitioners;
- The individualization of the terms (duration) of mastering the basic educational program (in accordance with a mandatory curriculum);
- The development of various ways of licensing professional activities.

The European Union, combining several dozens of countries with their national educational standards, necessarily makes demands to organize not only the economic zone suitable for all but also the academic one. There is a strong need for standardization (or even universalization) of curricula (educational programs), including the field of medical education. At the time, the European Qualification Framework seemed to be a quite good solution.

According to the idea of its creators, the European Qualification Framework is a comprehensive instrument aimed at making national qualifications more transparent and comparable across Europe (*European Qualifications Framework (EQF) – Official position of the board of the Federal Institute for Vocational Education and Training, 2005*). Other functions of the European Qualification Framework are as following:

- Promoting occupational mobility between countries of the European Union;
- Promoting educational (academic) mobility between the different national training systems;
- Facilitating lifelong learning of specialists.

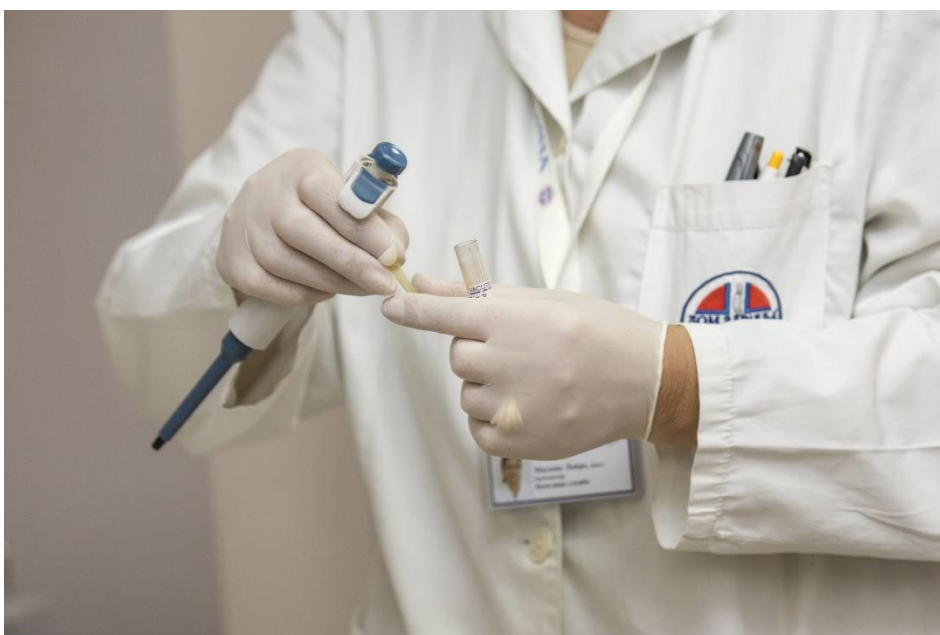
In addition, the structure of the European Qualification Framework may provide a kind of potential “for promoting transferability between initial and further vocational training and higher education” (*European Qualifications Framework (EQF) – Official position of the board of the Federal Institute for Vocational Education and Training, 2005*).

In the context of the current pedagogical report, we may consider the European Qualification Framework as the guideline on creating curricula and writing learning outcomes for every European country with respect to its mentality, infrastructure, level of digitalization, and human resources available.

In Russia, the system of higher and secondary medical education attracts close attention nowadays. It is determined by increased academic mobility and the availability of opportunities to improve the material and technical base. The most popular trends are as following:

- Writing educational programs in accordance with the competency-oriented approach (with some elements of the model based on learning outcomes);
- Developing inclusive education in medicine (the involvement of people with physical constraints, impaired vision and/or hear).

In the attempt to cover the current state and perspectives of medical education in the world, we may conclude that the great attention is now paid not only to building special knowledge of medical disciplines and mastering professional skills but also to the development of professionally important personality characteristics as well as pedagogical aspects of professional activity.



## Challenges in teaching healthcare professionals

The training of highly qualified healthcare professionals depends not least on the qualification of teachers (lecturers, mentors) and their creative attitude towards the discipline (*Ermalovich, 2017; Laptieva & Rublevskaya, 2014*). It is always the mentor, who provides students with the orientation on the development and self-development of their skills and abilities. He/she forms their attitude towards the training, education, and future profession. Teachers (lecturers, mentors) prepare not only the theoretically and practically well-educated healthcare worker. It is more important that they train the holistic, creatively thinking individual with the formed sense of professional and civic responsibility (duty).

The utilization of information technologies within the space of professional activity has become a mandatory attribute of the modern society of Western type. It would not be an exaggeration to say that the professional activity of a healthcare worker is almost always connected with the use of achievements of digitalization: from electronic medical records stored in the “cloud” to telesurgery (remote surgery). It is obvious that no matter how diligently and efficiently teachers prepare a new generation of professionals for work in current socio-economic conditions. The knowledge of these specialists will be inadequate as soon as the basic technological platform is replaced. The change of the basic technological platform is getting regular and happen once in 3-5 years. Therefore, the obsolescence of knowledge of specialists turns out to be a factor that fatally captures all spheres of society. It means that the main pedagogical imperative of the modern era is that the educational institution must teach a student how to think and how to learn (*Denisov, 2004*). The educational activity of a student at a higher educational institution implies the existence and subsequent development of skills for independent work, as well as self-control and independent regulation of behavior.

The shift from the principle of education “for life” to the principle “through life” is particularly relevant in the field of medical education and should be carried out utilizing three aspects of the educational process (*Ermalovich, 2017; Laptieva & Rublevskaya, 2014*):

- Traditional educational resources (lectures, practical classes, workshops, presentations, models, analytical scrutiny of video recordings, etc.);
- Independent educational resources that require the teacher’s participation (preparing reports for presentations at scientific and practical students’ conferences, preparing for



competitions of professional mastery, controlled independent supervision of patients, monitoring results, etc.);

- Autonomous educational resources that do not require the teacher's participation (distance learning, a multimedia course for self-training, electronic copies of handbooks, Internet-resources, etc.).



## The objectives of learning and outcomes

Course objectives are clear and concise statements that describe what you intend your students to learn by the end of the course. The difference between course objectives and learning outcomes—and the reason these terms are so often conflated with each other—is the former describes an intended state (what you hope your students will learn), whereas the latter expresses a present or observed state (what your students actually learned). Both course objectives and learning outcomes are distinct from learning goals, which are more broadly conceived.

The way of defining goals suggested by the pedagogical technology is quite technical. Its essential part is that educational goals are formulated through the learning outcomes. These learning outcomes are described in student's actions that could be clearly identified and assessed by a teacher (mentor).

In the everyday practice of educational work, the following solutions may be suggested:

- Building up the system of goals with categories and consequential levels (hierarchy); such systems are now called taxonomies.
- Creating a clear and comprehensive language suitable for describing educational goals. Nowadays, the model of learning outcomes is preferred. At some point, we may call the EQF being this language system (instrument, tool) to state goals.

We may consider the following instruments suitable for the realization of educational goals in the affective (emotional) scope: lectures, learning through observation (by personal example), group discussions, mental (mind) experiment, situational tasks (including ethical ones), group charity project, etc.

Skills in the psychomotor domain are in special demand in such fields as natural sciences, clinical medicine, disease prevention, arts, music, engineering, and physical education. However, for the unknown reason, B. Bloom and his team had decided not to trouble themselves with formulating possible goals for this scope. Later on there were other specialists who developed this further.

So, for example, R.H. Dave (1970) suggested the following 5-level hierarchy:

1. Imitation. Observation and replication of other people behavior. A student observes the mentor's actions and copies them in safe situation.

2. Management. The ability to perform some certain actions following the instructions and applying obtained previously skills. A student follows the instruction, algorithm, or protocol and replicates the necessary actions as required with no improvisation.

3. Accurateness. Skill is acquired, which is evident from its clear and accurate performance. On this level, a student is capable of performing a task with fewer mistakes. Skill is getting more accurate with no example, algorithm, or schema.

4. Connection. It is about the ability to coordinate a range of actions by combining two or more motor skills. A student is capable of doing a difficult task which consists of a few stages (elements) using various skills obtained earlier. Algorithms may change in accordance with the precise requirements or to solve a problem.

5. Naturalization. Skills are combined, integrated and used sustainably and with no struggle. A student demonstrates the high level of performing a skill automatically (with no considerations).

Later, E. Simpson (1972) developed a more detailed hierarchy of educational goals in psychomotor scope which consists of seven levels:

1. Perception. It is about the ability to use observed signals to stimulate one's own physical activity.

2. Attitude (mentality). It is about preparedness to the certain modus operandi. It may include psychological, physical, and emotional predispositions. A student is in the mood and ready to undertake some medical manipulations.

3. Managed reaction. It is about obtaining a motor skill via the so-called trial and error method. A student trains a motor skill in a safe situation by repeating, analyzing mistakes, and improving the following actions. Such an approach leads to more effectively performing a skill.

4. Automatic action. It is an intermediate stage of training a motor skill. A student may already demonstrate obtained motor skills in controlled circumstances. Acquired reactions become more habitual. Actions may be performed with obvious confidence and mastery.

5. Complicated apparent reactions. The physical activity with the clearly complicated character of movements is possible on this level. A student practices a skill in sensitized conditions (for example, with distracting factors presented nearby). Reactions are automatic; mastery is evident from the coordinated performance with minimum or no non-effective efforts.

6. Adaptation. On this level, motor skills are well developed. A student may change some movements in accordance with the precise requirements or task's conditions.

7. Creation. Motor skills are developed so well that it becomes possible to do improvisation. A student is confident about his/her professional skills and is capable of doing an improvisation or to perform actions in unusual professional situations.

Other examples of taxonomies in regard to psychomotor skills are Harrow's taxonomy (1972) and Dawson's taxonomy (1998).



If talking in general, all the taxonomies in psychomotor scope describe the shift from simple observation to learned (obtained) physical (psychomotor) skills.

Nowadays, Bloom's taxonomy is widely used not only in education but also in other fields of human's activity. Many people criticize it. For example, it has been noted that there may be six categories in the cognitive scope, but the consequential hierarchical connection between them does not necessarily exist. Anyway, it is not losing its relevance, so everyone may find something interesting and helpful in it.

The aim of a module or program is a general statement regarding what a mentor plan to teach to the students. Usually, goals are described from the teacher's point of view in order to show the main content and direction of a module (program).

The objective of a module or program often looks like a precise statement of intentions of educational activity. It relates to one of the precise fields that a teacher plans to explain to the students.

From the numerous definitions of the concept “learning outcomes”, we may extract the following:

- learning outcomes are focused on students' achievements, not on the content of what has been taught.

- learning outcomes are focused on what trainees will be capable of demonstrating by the end of a study.

So, now the main question to a student or graduate is “what can you do now after getting a degree?” instead of “what are you doing to get a degree?”. The approach based on learning outcomes is, above all, a point of view and a way of thinking that allow constructing sufficient modules (programs).

J. Moon (2002) proposed an idea that while writing an educational module (program) it makes sense to describe two types of learning outcomes. The first type is the learning outcomes that may be assessed during the course of study – in the context of various modules (programs). The other type of learning outcomes may not be assessed during the course of study. However, it gives employers and other stakeholders a kind of impression of the level of the real performance of specialists. These “declarative” or “desirable” learning outcomes show what the good student is likely to achieve by the end of a course.

We may find a lot of information regarding what is the best practice of writing learning outcomes (*Fry et al., 2000, Jenkins and Unwin, 2001, Moon, 2002*).

In his work, R.M. Harden (2002b) considers the utilization of learning outcomes for creating a kind of educational model suitable for training of healthcare professionals. Learning outcomes should be defined so that they can cover the whole range of necessary competencies and put the focus on the integration of various competencies into medical practice. Graphically Harden's model of learning outcomes looks like a complex of three circles placed one into another. In the inner circle, there are seven learning outcomes related to what a doctor (healthcare practitioner) can do, meaning his/her expected technical competencies (“to do a demanded thing”). In the middle circle, there are learning outcomes associated with how exactly a doctor (healthcare professional) performs a professional task: with knowledge and comprehension, with appropriate attitude and strategy of decision-making (“to do a manipulation correctly and carefully”).

The outer circle includes learning outcomes characterizing the continuous professional development of a healthcare practitioner as a specialist and as a personality (“the right man does this”) (*Harden, 2002b*).

When writing learning outcomes for a module/program, the minimally appropriate level that a student has to master for getting credit should be described. Therefore, better to have a limited number of the most important learning outcomes rather than having a huge number of secondary ones.

Another important thing in writing learning outcomes is that they should be connected with educational activity and assessment process. It is not a secret that many students prefer to learn the material which they think will be assessed (via test, interview, or exam) not the material that is included in the educational program in general. The teacher's objective is to guarantee that training methods, assessment procedures, assessment criteria, and learning outcomes are overall congruent. S. Toohey (1999) thinks that the best way to help students realize how could they achieve learning outcomes stated for them is to accurately explain the techniques and criteria of the assessment process. Therefore, learning outcomes should be stated in a clear and simple way and allow the effective assessment.

It is significant to ensure that the selected assessment tool allows estimating learning outcomes accurately. There might be no universal way of assessment that is suitable for all learning outcomes. Therefore, the need to use several assessment tools may arise.



## Methods that can be utilized

One of the main problems in modern training activity assume to be the extensive theoretical preparation in association with professional practical skills of poor quality. It explains the tendency to the wide implementation of interactive training methods, especially in the field of medical education where the harmonious combination of theory and practice matters a lot (*Artjukhina & Chumakov, 2012*). The significance of self-training (self-preparation) in students is getting more vivid. It supposes the qualitative change of traditional forms of educational activity in accordance with the goals and objectives of the development of students' intellectual potential.

Interactive educational (training) methods agree with the personality-centered approach to the most extent since they supposed to recruit co-education (training in cooperation). In the context of co-education, both a teacher and a student become subjects of the educational process.

Games may be used as pedagogical method. In general, we may differentiate the games with rigid scenarios and role games that allow including improvisation on the topic provided. Business games vary in the technique of managing and goals stated:

1. Educational games are directed on the emergence of new knowledge and strengthening the necessary skills.
2. Search games are directed on detecting problems and finding possible ways to solve them.
3. Imitation games have the goal to create an idea of how to act in certain circumstances.
4. Innovation games form the innovative thinking in trainees.
5. Organizational activity games have no rigid rules: participants do not play prescribed roles. Thus, these games are aimed at solving some interdisciplinary problems.

A prerequisite for learning effectiveness is changing roles and playing several games, given the increasing degree of complexity, since participation in similar games usually does not give the desired result.

Various types of business games are utilized in medical education.

We may mention just a few:

1. “Doctor (healthcare professional) and patient”. This is a classical form of the clinical game, which is modeling the circumstances (conditions) of the intellectual professional activity of a doctor (healthcare practitioner). It may be used in a variety of settings – from one student playing with the mentor to the mentor using this method at the lecture and playing with the group of students.
2. “Concilium” (consultation). Students, getting some information, start discussing with each other what to undertake in this proposed clinical situation. They must decide whether they need any additional information (consultations of other specialists, results of lab tests, etc.). When students made a decision, they must represent it to the mentor or enter into the computer program. After this, the leader (mentor, trainer, teacher) guiding with the standard scenario gives required information to the students (for example, information about family problems) or the information regarding a change in the patient’s condition.

The European Union has made a framework, describing the different levels of qualifications. In our project we have focused on EQF level 4, so below is the descriptors for the European Qualification Framework Level 4 (*Descriptors defining levels in the European Qualification Framework (EQF)*).



Table 1.

Educational (training) tools associated with descriptors of the EQF Level 4

<i>Knowledge</i>	<i>Factual and theoretical knowledge in broad contexts within a field of work or study</i>	<i>Lectures*, seminars**, work in small groups, group discussions, work with documents (paperwork), discussion complex and ambiguous moments (concepts, models, hypothesis, etc.) in the studied materials and empirical observations, work with graphics models (visual aids), utilization of public (social) resources (invitation of a specialist, excursion)</i>
<i>Skills</i>	<i>A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study</i>	<i>Creative tasks, educational (training) games (roleplaying, business, educational), learning through imitation, simulation training, social projects, case method, situational tasks, “everyone teaches everyone”, discussion the cases from one’s own practice, analysis of video-recordings</i>
<i>Responsibility and autonomy</i>	<i>Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities</i>	<i>Business games, modeling of the professional activity involving simulation learning technologies, creative tasks, social projects, competitions, utilization of public (social) resources (excursions), testing, exam followed with discussion, group supervisions, group discussions, interview</i>

Source: <https://ec.europa.eu/ploteus/content/descriptors-page> (12. January 2018)

\* Taking into account the availability of an enormous amount of information (theoretical data) via the Internet, we must admit that teachers are having a hard time trying to capture students' interest (attention). Even personality (psychological) influence does not work, if the study content seems to have no value or students may find it in books or via the Internet on their own. Therefore, the normative (mandatory theoretical minimum) content is better to offer using information technologies like distance (the Internet) learning with mandatory checks.

These control points (after studying some new materials) should require not only reproductive mental (cognitive) actions but also creative cognitive actions. Saving lectures as a way of transferring of theoretical knowledge to students seems rational only if these lectures are presented by famous researchers or practitioners who are able to provide students with unique data. For example, it might be the results of their newest research projects, their own clinical observations, presentations of exclusive method or technique.

\*\* To date, seminars consider being the way to control students' knowledge and a kind of space to share and exchange opinions, which is partly a way to get new information too. In addition, attending seminars helps students to clear ambiguous moments in studying material. These educational goals may be also achieved by working in small groups or having group discussions.

## Emotional distress

Studying medicine at university requires hard work and motivation. The medical school curriculum is vast, and as well as being academically rigorous, also holds emotional challenges. This can predispose students to mental health issues, which include depression and suicidal thinking. Since these are significant issues, we feel it is important to highlight the reasons behind them, and the options available to students to deal with them.

During exams (finals), high requirements are presented to the intellectual abilities and emotional resilience of students. It determines hyper-excitation (hyperstimulation) of the central nervous system and hyper-compensatory character of adjustment reactions of the student's organism.

Therefore, physical health and psychological well-being of future healthcare professionals are threatened.

Herewith, such a regimen (schedule) is not replaced by a favorable one (for example, self-care, health-protective behavior, etc.) after getting a degree / advanced training. As a rule, early career healthcare practitioners continue working at the same pace (*Kay, 2018*). Nowadays, more than ever, the issue of the professional health of healthcare workers is getting acute.

Thus, in Russia, it is a separate topic for research in Clinical Psychology (*Ulanova, 2016*). In the United States and the European Union, the regulatory authorities set about rationalizing the work and rest schedule for medical students, residents, and early career healthcare practitioners.

The need for careful monitoring of the functional state and performance of students in the learning process is getting more obvious. In order to prevent overwork, the study of the compliance of the curricula with the age functional capabilities of the student's organism (on average) is very relevant nowadays. To the best of our knowledge research on this topic are fragmentary and equivocal. More research on the topic needed.

### Healthcare workers and pedagogy

Care and education have much in common, and work in the healthcare sector is closely associated with learning and teaching. It is felt that many in the healthcare and medical services are not aware of their pedagogic skills and how they can be developed. FRAME OF REFERENCE: Belonging to a community of practice means that you share perspectives, methods and language. The aim is to describe the pedagogical discourse by identifying pedagogical processes and studying the staff's awareness of such processes or situations in which a pedagogical approach would be useful in their work with patients and next of kin. A qualitative study based on individual and group interviews. The analysis is directed by grounded theory. The pedagogical processes varied in length and quality. Most were unplanned and were usually embedded in treatment.

The pedagogical process is linear (planning, goal setting, teaching and evaluating) in an educational setting but we found that the beginning and end can be unclear and the goals can be vague or non-existent. The pedagogical process is best described using the concepts Read, Guide and Provide learning support. The pedagogical discourse in healthcare is almost silent. Data indicate that at the collective level there is very little support for professional development of pedagogical ability.

Tacit knowledge may therefore remain silent even though it may be possible to formulate and describe it. There is a strong need to focus on the pedagogical parts of the work and to encourage and support the development of professional pedagogical knowledge.

Public education in medicine necessarily implies a greater psychological impact and is mainly focused on the formation of the healthy personality, habits of a healthy lifestyle, patient's conscious attitude towards own health, and on the creation of motivation to use health technologies. At the same time, education is carried out in a comprehensive manner – in the relationship between mental, moral, aesthetic, and patriotic aspects.

We may formulate the following taxonomy of pedagogical functions concerning the professional activity of healthcare workers (*Kulikov, 2011; Matvejchik, 2005*):

1. The constructive-informative function helps:
  - to select and to organize the content that should be learned by patients or other participants of the therapeutic and rehabilitation process;
  - to project the process of educational activity in which the information might be assimilated;
  - to train and to rehearse one's own future pedagogical activity and behavior as they have to be when interacting with trainees.

*Pedagogical methods used: search of information; underlining and highlighting information in the text; writing notes and reviews; preparing flashcards and scenarios.*

2. The instructive-methodic function implies various types of interaction between a healthcare worker, patients and other participants of the therapeutic and rehabilitation process.
  - Teaching the methods and techniques of nursing self-care;
  - Demonstration of the sequence of all operations that constitute a particularly complex medical/rehabilitation action;
  - Individual and/or group consultations on the issues of nursing care, prevention of certain diseases and bad habits, family planning, healthy lifestyle, etc.;

- One's own pedagogical activity and behavior in the process of direct interaction with patients and other participants of the therapeutic and rehabilitation process.

*Pedagogical methods used: conversation, explanation, demonstration, consultation, group discussion, presentation.*

3. The communicative function involves the establishment of professional relationships and interactions of healthcare workers with patients and other participants of the therapeutic and rehabilitation process taking into account gender, age, social status, temperament, physical and mental condition, ethnical-cultural identity, etc. using verbal and non-verbal communication.

*Pedagogical methods used: observation, conversation, interview, analysis, survey, business games.*

4. Correction and control functions are indicators of control activity as part of the educational process. They serve as the main basis for controlling the results of the conducted interaction in the treatment and rehabilitation process. In other words, this is feedback. "Feedback" allows assessing the dynamics of the educational level in patients, make appropriate adjustments.

*Pedagogical methods used: analysis of regulatory documents and reports, a study of the opinions of participants in the treatment and rehabilitation process on the results of the work carried out, test, interview, survey.*

Recently, popular-science books on medical subjects (*Enders, 2015; Moalem, 2007; van de Laar, 2018*) are gaining great popularity. Medical workers conduct written blogs and video blogs, where they communicate with their patients and promote popular medical knowledge.



## REFERENCES

1. Artjukhina A.I., Chumakov V.I. Interactive teaching methods in a medical university: study guide. Volgograd, Russia: Volgograd State Medical University Publishing; 2012.
2. Bezrukova V.S. Pedagogics. Projective Pedagogics: textbook. Ekaterinburg, Russia: Business Book; 1999. (In Russian).
3. Bloom B.S., Engelhart M.D., Furst E.J, Hill W.H., Krathwohl D.R.A. Taxonomy of educational objectives. Volume I: The cognitive domain. New York, New York: McKay; 1956.
4. Bloom B.S., Masia B.B., Krathwohl D.R.A. Taxonomy of Educational Objectives. Volume II: The affective domain. New York, New York: McKay; 1964.
5. Carraccio C., Englander R., van Melle E., et al. Advancing competency-based medical education: A charter for clinician-educators. *Academic Medicine*. 2016; 91: 645-649.
6. Custers E.J.F.M., ten Cate O. The History of Medical Education in Europe and the United States, With Respect to Time and Proficiency. *Academic Medicine*. 2018; 93 (3 suppl): S49-S54.
7. Dave R.H. Psychomotor levels. In R.J. Armstrong (Ed.), *Developing and Writing Behavioral Objectives*. Tucson, Arizona: Educational Innovators Press; 1970.
8. Dawson W.R. Extensions to Bloom's Taxonomy of Educational Objectives. Sydney, Australia: Putney Publishing; 1998.
9. Denisov I.N. Medical education: the situation today and ways to improve the training of doctors. *Medical Doctor*. 2004; 4: 4-7. (In Russian).
10. Descriptors defining levels in the European Qualification Framework (EQF). Available at: <https://ec.europa.eu/ploteus/en/content/descriptors-page>
11. Egorov V.V., Skibitskiy E.G., Khrapchenkov V.G. Higher Education Pedagogics. Novosibirsk, Russia: SAFBD; 2008. (In Russian).
12. ECTS Users' Guide. Brussels: Directorate-General for Education and Culture. 2005. Available at: [http://ec.europa.eu/education/programmes/socrates/ects/doc/guide\\_en.pdf](http://ec.europa.eu/education/programmes/socrates/ects/doc/guide_en.pdf)
13. Enders G. Gut: The Inside Story of Our Body's Most Under-Rated Organ. Vancouver, Canada: Greystone Books; 2015.
14. Ermalovich A.V. Pedagogical aspects of medical education. "Graduate School": scientific and journalistic journal. 2017; 1(117): 60-64. (In Russian).
15. European Qualifications Framework (EQF) – Official position of the board of the Federal Institute for Vocational Education and Training. 2005. Available at: [https://www.bibb.de/en/pressemitteilung\\_995.php](https://www.bibb.de/en/pressemitteilung_995.php)



16. Frank J.R., Mungroo R., Ahmad Y., Wang M., De Rossi S., Horsley T. Toward a definition of competency-based education in medicine: A systematic review of published definitions. *Medical Teacher*. 2010; 32: 631-637.
17. Fry H., Ketteridge S., Marshall S. *A Handbook for Teaching and Learning in Higher Education*. London, UK: Kogan Page Limited; 2000.
18. Harden R.M. Developments in outcome-based education. *Medical Teacher*. (2002a); 24 (2): 117-120.
19. Harden R.M. Learning outcomes and instructional objectives: is there a difference? *Medical Teacher*. (2002b); 24(2): 151-155.
20. Harrow A. *A taxonomy of the psychomotor domain – a guide for developing behavioral objectives*. New York, New York: McKay; 1972.
21. Hodges B.D. A tea-steeping or i-Doc model for medical education? *Academic Medicine*. 2010; 85 (9 suppl): S34-S44.
22. Jenkins A., Unwin D. How to write learning outcomes. Available at: <https://www.ubalt.edu/cas/faculty/faculty-matters/How%20to%20write%20student%20learning%20outcomes.pdf>
23. Kay A. *This is going to hurt: secret diaries of a junior doctor*. London, UK: Pikador; 2018.
24. Kudrjavaja N.V. (Ed.) *Pedagogics in Medicine: tutorial*. Moscow, Russia: Academia; 2012. (In Russian).
25. Kulikov S.I. *Pedagogical foundations of professional activities of a modern doctor (Unpublished PhD dissertation)*. Kaliningrad, Russia. 2011. (In Russian).
26. Laptieva L.N., Rublevskaya E.I. Pedagogical aspects of the professional activity of healthcare workers. *Bulletin of MGPU named after I.P. Shamyakin*. 2014; 1(42): 82-89. (In Russian).
27. Mager R.F. *Preparing instructional objectives*. Belmont, California: Pitman Learning; 1984.
28. Matvejchik T.V. *Nurse and socially significant patient: basics of nursing pedagogy and professional development*. Minsk, Belarus: Department for the Execution of Punishments of the Ministry of Internal Affairs of the Republic of Belarus; 2005.
29. Moalem A. *Survival of the sickest*. New York, New York: HarperCollins Publishers; 2007.
30. Moon J. *The Module and Programme Development Handbook*. London, UK: Kogan Page Limited; 2002.
31. Simpson E. *The classification of educational objectives in the psychomotor domain: The psychomotor domain*. Vol. 3. Washington, DC: Gryphon House; 1972.
32. Snell L.S., Frank J.R. Competencies, the teabag model, and the end of time. *Medical Teacher*. 2010; 32: 629-630.
33. Ten Cate O. What is a 21st-century doctor? Rethinking the significance of the medical degree. *Academic Medicine*. 2014; 89: 966-969.
34. Toohey S. *Designing Courses for Higher Education*. Buckingham, UK: SRHE and Open University Press; 1999.
35. Ulanova N.N. Psychology of occupational health of the doctor – a new direction of psychological research. *Personality in a changing world: a network journal*. 2016; 1(12): 21-26. Available at: <http://humjournal.rzgm.ru/art&id=191>
36. Van de Laar A. *Under the Knife: A History of Surgery in 28 Remarkable Operations*. New York, New York: St. Martin's; 2018.