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# The Docimologically Based Evaluation of Knowledge in Vocational Education of Healthcare Professionals

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## Abstract

*Diversity of teaching curriculum in vocational subjects requires the application of different didactic-methodical approaches to teaching, and thus different methods for students' knowledge evaluation. Objective assessment of knowledge is the imperative of the quality vocational education of healthcare professionals; in the evaluation of students' progress and final assessment of students' knowledge, the formative and summative methods are commonly used during or after the course of a particular subject. Modern higher education insists on objectivity and scientific foundation of the evaluation process, which is the main reason why the didactic docimology has finally received a deserved place in the pedagogical practice in the last decades. The aim of this paper is to emphasize the importance of the unconditional appliance of scientific principles in students' knowledge evaluation, critically analyze elements of the existing objective methods of assessment in vocational education of healthcare professionals, and to emphasize the social and professional significance of the student's final grade, which should be an unambiguous indicator of acquired professional skills of a graduate student of healthcare sciences.*

**Key words:** *final grade; formative knowledge assessment; healthcare science; skills; summative knowledge assessment.*

## Introduction

Healthcare sciences, including nursing science, physiotherapy, nutritionism, applied medical radiology, midwifery and others, represent the group of the relatively young

applied medical disciplines, which are conceptually based not only on medicine but also on the scientific knowledge from other humanistic sciences - pedagogy, psychology and sociology (Kovačević & Dobrašinović, 1999; Tijanić et al., 2010). Non-physician healthcare professionals are the most common professionals in the healthcare systems all over the world; globally, they make up to almost three-quarters of all health workers involved in all three levels of comprehensive health care - primary, secondary and tertiary. At the same time, the *Bachelor of Applied Sciences* (BASC) is the most common academic degree in various areas of healthcare science, more focused on clinical or preventive practice than on scientific theory, enabling graduates to join professional practice right after finishing studies (Arsić-Komljenović et al., 2012; United States Department of Labor, 2018). It is expected that a graduate student of healthcare sciences has acquired competencies for the application of theoretical knowledge, clinical or prevention skills, and adequate professional communication during the performance of its professional activity.

The basic curriculum goals of vocational studies in healthcare sciences are as follows (Faculty of medicine Novi Sad, 2018):

- 1 to enable students to independently, efficiently and responsibly perform professional care, based on the ethical principles and holistic approaches to the individuals in need, in various areas of health care;
- 2 to enable students to apply acquired theoretical knowledge and skills in all forms of patient care, including professional activities for improving health, disease prevention and health promotion;
- 3 to enable students to apply professional care in primary health care institutions, general and specialized hospital facilities, rehabilitation centers and social welfare institutions, respecting differences in culture, religion, ethnicity, sexual orientation and other aspects of life;
- 4 to enable students to conduct evidence-based healthcare;
- 5 to qualify students for management positions in the healthcare system.

Considering previously mentioned curriculum goals, it is understandable that the evaluation of the acquired knowledge has an extremely important role in the process of teaching healthcare sciences. Contemporary vocational education of healthcare professionals is focused on learning outcomes that are precisely determined by educational standards, as well as the acquisition of professional competencies that will enable graduate students to be actively included in professional activities. The orientation of the educational process on learning outcomes has consequently led to a reorganization and rationalization of knowledge evaluation, which is now considered as an integral part of the interactive teaching process. Student's knowledge assessment cannot be viewed only as a formal assignment of grades for the knowledge shown in the exam but as a daily activity of teachers which is in the function of supporting the learning process. The entire teaching process must be focused on feedback from the

student who should understand each previously set learning outcome and criteria of success evaluation, since this is an essential prerequisite for effective monitoring of progress during studies. Diversity of teaching curriculum in the vocational subjects requires the application of different didactic-methodical approaches to teaching, and thus different methods for students' knowledge evaluation. An objective, rational, comprehensive and scientific, docimologically based evaluation of knowledge is a very significant aspect of modern vocational education that is adapted to the actual needs of students and practical educational goals. It should be noted that appropriate knowledge assessment is one of the key elements in ensuring the quality of vocational education, because by monitoring and evaluating the achievement of set outcomes, it actively contributes to improving the overall teaching process and organization of the education system of a country.

## **Principles of the docimologically based knowledge evaluation in vocational education of healthcare professionals**

Knowledge evaluation is an integral part of education since the very beginning of this social phenomenon, but it is still its most conservative part. Additionally, the assessment of student knowledge is an extremely sensitive area of the teaching process, not only in pedagogical but also in a psychological sense and subjective perception of studying of each student individually (6). From the Bologna reform of university education to the present day, more attention is focused on the rationality, goals and objectivity of assessing students' knowledge than in the past. Modern university education insists on objectivity and scientific foundation of the evaluation process, which is the main reason why didactic docimology has finally received a deserved place in the university pedagogical practice in last decades (Ranković-Vasiljević, 2003; Tascovici, 2008).

Didactic docimology (*dokime*, gr. – to make a judgment; *logos*, gr. - science) is a pedagogical discipline with a purpose of bringing objective judgment in the teaching process, or, simplified, docimology is the science of exams and knowledge evaluation. Considering the original definition of this term, the final judgment must be based on reliable facts; otherwise, it will not be an objective, but just a random, subjective phenomenon. Consequently, docimological evaluation can be understood as a process of collecting relevant facts about acquired knowledge, whereby a lecturer creates a base for his final comprehensive judgment about student - student's grade. Essentially, didactic docimology deals with the scientific evaluation of knowledge, by disclosing good and bad practices to consolidate former and improve future pedagogical practice (Geuye, 2002).

It is less known that lecturers of healthcare sciences probably apply significantly more docimological principles in the evaluation of student's knowledge, compared to other professional subjects' teachers whose pedagogy and related sciences are also not the primary area of their basic education. The reason for this assumption lies in the fact

that pedagogy, as well as didactics and methodology of lecturing in different healthcare sciences, are being studied in the majority of university institutions with healthcare study programs all over the world. Studying of didactic docimology fundamentals in healthcare studies is explained by the specificity of healthcare professionals' education and professional requirements of all healthcare professions. By using a docimology based methods of evaluation, the lecturer minimizes the possibility to rely exclusively on its own experience and subjective criteria in assessing student's knowledge. Increasing its quality is the fundamental purpose of any kind of evaluation in some human activity: the regular use of docimological principles in assessing healthcare students' knowledge should contribute not only to the overall improvement of the teaching process, more objective classification of students, development of critical thinking and elimination of student learning problems but also to remedy for the shortcomings in the lecturer's professional activity (Ranković-Vasiljević, 2003).

Knowledge assessment in studying healthcare sciences is significantly different from other sciences due to specificity of education goals, as well as objectively small lecturer's opportunities to tolerate student's mistakes or ignorance. For example, students of nursing science have to know, both theoretically and practically, all anticipated steps in performing some nursing procedure; otherwise they can endanger the patient, injure them, and expose them to infection or any other kind of unwanted complications. However, despite all the mentioned specifics, evaluation of acquired knowledge of the students should always be based on the following seven docimological principles:

- 1 universality - all anticipated aspects of teaching curriculum should be covered by knowledge evaluation;
- 2 continuity - the evaluation of students' knowledge should be carried out continuously during the course, not just on the final exam (this is the most problematic aspect of university education);
- 3 objectivity - the final grade should match the student's real knowledge (this aspect can only be realized if there is a stable assessment criterion of expected student knowledge catalogue);
- 4 absence of "third" factors influence in the knowledge assessment - the knowledge evaluation should not be affected by any factor that is not the subject of current assessment;
- 5 rational use of the time required to test students' knowledge - all students have inalienable right to present knowledge in an equal planned timeframe;
- 6 justness - the final grade must be based on the actual achievement and student's knowledge, without the influence of any prejudices and other subjective factors;
- 7 publicity of assessment - the student's assessment must be public, there is no pedagogically justified reason for the secrecy of final grade; additionally, all reasons for the final grade should always be explained to the student (Geuye, 2002; Ranković-Vasiljević, 2003).

Competence-based knowledge assessment is a concept that is successfully implemented in all relevant education systems directed at the production of highly qualified professional staff. Docimological methodology of this kind of knowledge evaluation ensures the relevance and reliability of the education system in vocational education, based on a clear correlation between the content of assessment and competencies prescribed by the existing standard of a certain professional qualification (Glišić & Jadrijević-Mladar, 2013). One of the most important goals of education in the bachelor degree vocational education of healthcare professionals is acquiring certain professional competencies that are relevant to the future engagement of graduated students in different kinds of the healthcare profession. Professional competencies are a combination of skills, knowledge, attitudes, values, abilities and judgments that enable healthcare expert to deal with professional activities appropriately. Competence indicates a sufficient amount of knowledge and skills that a particular person has and which enables the implementation of professional activities in a wide range of work-related situations (Glišić & Jadrijević-Mladar, 2013; Šepec, 2011). In a practical sense, it means that competence represents the real ability of a particular person to perform a certain professional activity (Matijević, 2011). Defining professional competencies is an extremely important part of student achievements evaluation - the first step in functional knowledge assessment is the recognition of learning outcomes and definition of criteria based on them (Ilić, 2014). Without acquiring professional competencies, vocational education would not have any sense, which makes a scientifically based assessment of students' knowledge even more important, than it seems in the first moment.

By organizing the teaching process, lecturers of health sciences must collect information about competence acquiring level, acquired knowledge and professional skills, student's interest in some areas of professional work and education, demonstrated independence in practical activities, development of communication skills, as well as other advancement aspects of students whose learning outcomes are followed (Matijević, 2011). As it was noted above, evaluation of student's knowledge has a final, visible result - the final grade. This grade has multiple functions: to inform about the level of knowledge that student has acquired (theoretical or practical, depending on the subject matter), to point out all possible causes of obtaining certain grade, to show student's potential progression in a particular professional area, to motivate the student to learn even better, to stimulate student's interest in a particular scientific or professional domain, and, finally, to fulfill the administrative function and enable the student to continue further education. In the university education of healthcare professionals, different ways to determine the final grade of students are currently used; however, in most world countries there are two types of student grades: numeric (alphabetical) and descriptive (Mešter, 2006; Ranković-Vasiljević, 2003).

Numeric grading is the oldest and, at the same time, most criticized and analyzed type of students' knowledge grading all over the world (Berg, 2005; Sadler, 2010).

The criticisms of this grading method are mostly related to examiner's subjectivity, grading scale objectivity, as well as to the assessment tool precision. Like in any other measurement, high precision of a measurement tool is very important in the process of knowledge measuring (Durm, 1993). However, the application of the Bologna declaration has significantly increased the objectivity of student knowledge assessment, comparing to earlier pedagogical practices. Unlike the time before this declaration, when the final student's grade was mainly the result of subjective examiner's assessment on the oral exam, the final numeric grade is now result of the score of points obtained on the basis of fulfillment of pre-examined obligations (up to 50%) and points obtained on a final test (other 50%). This type of final grading is used for most subjects that are part of healthcare sciences studies curriculum.

Descriptive way of grading is commonly used in knowledge evaluation of practical skills and mastering professional competencies. In general, descriptive way of knowledge grading is very convenient in all applied sciences, and therefore also in all healthcare sciences, primarily because of its informative character. The descriptive grade can objectively evaluate the student's knowledge of the theoretical fundamentals for a certain practical skill, work precision, development of therapeutic relationship skills establishment, the level of regularity in student's practical activities, student's accuracy, as well as most other parameters relevant to the healthcare professions (Tijanić et al., 2010; Šepec, 2011). It should certainly not be forgotten that descriptive assessment requires a uniform way of describing student knowledge within the same university institution; for this reason, most of the healthcare faculties have developed their knowledge assessment check-lists, based on qualitative descriptions of knowledge, offered on some type of metric scale, for every educational aspect that is assessed.

## **Objective methods of knowledge evaluation in vocational education of healthcare professionals**

The quality and reliability of knowledge assessment are important contributing factors to the public's trust in the educational system (Ministry of Education, Science and Technological Development of Serbia, 2008). To understand the importance of knowledge evaluation process in the education of future healthcare professionals better, it is necessary to look back at the essence of the healthcare profession. All healthcare professions are humanistic, assistive professions: because all these professions directly deal with human health and human life, there is practically not much space for making mistakes during professional activities (Ćirić et al., 2018). It is expected that graduate students of healthcare sciences have both the necessary knowledge and professional competencies that will enable them to be directly involved in professional activities, which is also the main reason for insisting on a high level of objectivity in the knowledge assessment in the vocational education of future healthcare professionals. Objective assessment of knowledge is the imperative of the quality vocational education; in the evaluation of students' progress and final assessment of students' knowledge, the

formative and summative methods are commonly used during or after the course of a particular subject.

Formative evaluation is carried out at certain moments during the teaching course of some subject to obtain feedback about student's progress in a particular teaching or professional area, aiming to improve student's knowledge achievement through evaluation methods that can at the same time support specific student needs (Theall & Franklin, 2010). Descriptive grading is extremely important in the education of healthcare professionals, since it helps students in better understanding and critical thinking about a specific subject, skill or other aspects of professional education while at the same time increasing the overall quality of learning (Koh, 2010). By constantly providing feedback, all methods of formative knowledge evaluation help students to become more self-motivated, but also to reach expected teaching goals. Encouraging this type of knowledge assessment is one of the most important strategies in building professional skills in students of healthcare sciences all over the world, not only in traditional, university education but also at e-learning platforms for healthcare professionals (Wolters Kluwer: Lippincot Nursing Education, 2018). There is a variety of methods of formative evaluation that are available to lecturers and instructors in the process of teaching vocational subjects:

- 1 in-class discussions – a frequently used method which promotes interactive communication among lecturer/instructor and students, to critically exchange and evaluate different viewpoints about learning topics, and stimulate students to learn from each other;
- 2 drawing a concept map – the method which stimulates students to critically analyze and interpret a level of understanding of the topic that is currently being studied;
- 3 one-minute reflection writing assignments – a short, in-class performed method based on student's written reflection about the topic that is being currently studied;
- 4 writing up to five descriptive sentences – this method is based on the identification of the main point of a studied topic;
- 5 homework assignments – this method stimulates students to write at home a short, critical review based on relevant facts related to the topic that was studied;
- 6 weekly/monthly scientific quiz – very popular, learning-stimulatory method based on multiple-choice questions related to the most important facts about earlier discussed topics (Yale Center for Teaching and Learning, 2018).

However, some researchers suggest that student preparation and effort are always better when the assessment is for summative purposes (Duers & Brown, 2009). Summative evaluation of knowledge is carried out at the end of the module or course. It has a remarkable educational and social significance; this significance is mostly based on the fact that this type of assessment gives a visible public result - the final grade, indicating the level of student's academic and practical competence in some scientific or professional field. Summative (final) assessment in the education of healthcare professionals provides individual evidence of academic achievement that is required

for future employment or further education (Ministry of Education, Science and Technological Development of Serbia, 2008). To gain and maintain public confidence for summative knowledge assessment, it is necessary to use objective, standardized procedures in the final evaluation, based at least on two basic docimological principles: validity and reliability (Ministry of Education, Science and Technological Development of Serbia, 2008; Cizek, 2009). There are a few types of objective summative assessment methods that are commonly used in vocational education of healthcare professionals: assessment of knowledge (multiple choice questions test - *Item*, short answer questioning test, essay type questions test) and assessment of professional skills (traditional/conventional practical examination, and *Objective Structured Clinical Examination* - OSCE) (Gogate, 2012; Obizoba, 2018).

*Multiple choice questions tests* (known as *Items*) are a very common method in the summative assessment of students' knowledge, especially in vocational studies. Despite many criticisms of this kind of assessment, it is impossible to dispute the higher level of objectivity and impartiality of this type of evaluation compared to the oral exam, in docimological sense. This kind of assessment is used extensively in the education of healthcare professionals in last decades; nowadays it plays a fundamental role in the design of educational programmes because it can be an effective and efficient way to assess learning outcomes (Brame, 2013). However, although multiple-choice questions tests are the most commonly used method of evaluating (mostly theoretical) knowledge, there is not much data available about their format, structure, validity and reliability in the context of the education of healthcare professionals (Considine et al., 2005). "A multiple-choice *item* consists of a problem, known as the *stem*, and a list of suggested solutions, known as *alternatives*. The alternatives consist of one correct or best alternative, which is the answer, and incorrect or inferior alternatives, known as *distractors*" (Epstein, 2007). To get the right answer, the student must critically think and bring a conclusion based on the validity of offered and known facts about the mentioned topic. The popularity of multiple-choice questions testing in the education of healthcare professionals can be explained by the possibility of providing examination items that encompass many content areas, it can be administrated in a short period of time, and, finally, it is an easy way to grade a large number of students (Epstein, 2007).

*Short answer questioning* is a method of summative assessment based on requiring the right answer to open-ended questions provided in the test. Practically, the student is required to supply a word, phrase, number, or symbol that is necessary to complete a statement or answer the question (Fraenkel et al., 1993). This kind of student knowledge testing is commonly used in final exams to assess both basic and deeper knowledge, depending on the complexity of the question. Unlike the multiple-choice test, this method of evaluation is based more on the objective acquisition of knowledge, as there is no possibility of guessing on the right answer. Also, several cognitive psychology studies confirmed that usage of short-answer tests in knowledge assessment promotes better retention compared with those which require recognition, like multiple choice answers test (Butler & Roediger III, 2007; Larsen et al., 2008).



*Essay questions test* is a very common type of written examination in bioethics, medicine and other healthcare sciences (Epstein, 2007). Considering specific requirements of the healthcare professionals' vocational education, an essay question type testing represents a very powerful tool for summative evaluation of knowledge in the pedagogical and psychological sense, since it measures higher levels of the student's thinking process, such as critical analysis and synthesis, as well as comparing, evaluating and reasoning (Lemons & Lemons, 2013; Stanger-Hall, 2012). Methodically, an essay is a student's written analysis or evaluation of some topic or issue that has been lectured during the teaching course. Usually, there are two types of essays used in students' summative assessment: closed-ended and open-ended (with or without restrictions made by the examiner). By using essay questions testing, the examiner can assess students' ability to recall, organize and integrate thoughts and ideas, the ability of critical thinking, as well as the ability to communicate and self express by writing (Kurdi, 2015; Lemons & Lemons, 2013).

*Traditional/conventional practical examination* is probably the oldest method of professional skills' assessment in the education of physicians and other healthcare professionals, implying an assessment of student's efficiency in the practical application of a standardized professional procedure to a real, living, hospitalized patient (Ranković-Vasiljević, 2003). In recent years, this way of skills assessment has often been criticized for several reasons: ethical (non)acceptability, limited examination performances, inadequate patients' collaboration with students, as well as the subjective influence of examiners when evaluating (Hasan et al., 2009; Zayyan, 2011). However, this method of assessment is still very popular in many healthcare university institutions, primarily because of the ability to inspect student skills in a realistic situation and realistic environment. The subjectivity of the examiner has been significantly reduced by using assessment check-lists during the examination, which procedurally tracks the performance of each skill which is being evaluated. Finally, it should be accentuated that traditional/conventional practical examinations should be performed only at a university's bases for clinical teaching, with previously obtained written approval of hospital management and written consent of the patient (Gogate, 2012).

*Objective structured clinical examination* – OSCE is the versatile, precise, objective, and reproducible multipurpose evaluative tool, customized for assessment of professional skills in a clinical setting, based on objective testing through direct observation (Zayyan, 2011). This kind of skill assessment may be used for either summative or formative evaluation processes. In the OSCE skill assessment, student's skill performance is assessed by a team of examiners in-charge of various 15-16 interactive "patient stations" of the examination. The "patient stations" can be various, according to the student's experience and the nature of the assessment (Ming-Chen et al., 2014). All "patient stations" are made to introduce students to different clinical scenarios. After each real-life interaction with patient models ("standardized patients", played by professional actors), students are required to complete the patient note at each "station". The OSCE has been successfully used in the last 40 years to evaluate skills that are most critical

or impossible to perform in the traditional practical examination, including the ability to interpret data, solve problems, educate, communicate, and handle unpredictable patient behavior (Jason et al., 1971; Ming-Chen et al., 2014).

## **Conclusion**

Evaluation of knowledge has always been the final stage of a complex teaching process, a teaching microelement in which all other teaching elements must be connected in harmonious and unique unison. From a scientific discipline that had been unfairly neglected for a long time, docimology has finally gained practical application and deserved a place in the organization and evaluation of university teaching in the last decades. The use of the docimological principles in knowledge assessment is particularly evident in vocational education; however, the main reason for this phenomenon should be found in the fact that this form of higher education is mostly directed to competency-based learning. Students of healthcare sciences are expected to obtain professional skills during their education, which will be immediately applicable in their professional practice after graduation. Even though the competency-based assessment functions may not differ for some from the functions of other knowledge assessment methods, this method highlights the independent work of the student and the demonstration of acquired knowledge and skills. Thus, it can be concluded that intensification of the interactive relationship between teachers and students, activation of certain segments of the learning process, as well as the simultaneous use of several different approaches and tools to assess student knowledge, represent the basic characteristics of the competency-based knowledge assessment in the vocational education of healthcare professionals. All those aspects of knowledge assessment, as an integral part of the educational process, essentially have the same goal: the best possible preparation of students for the future effective functioning in the health and social care system. Therefore, it is recommended that a plan for future knowledge grading be developed during the process of creating a study program curriculum, as well as criteria, methods and instruments for effective assessment of acquired competencies, always based on previously planned learning outcomes. It is well known that final grades have an extraordinary public significance at present, and should transparently indicate the level of knowledge and professional competence that is acquired during studies. Considering all above, it can be easily concluded that final evaluation of students' knowledge should be entirely based on docimological principles of assessment, especially the two which are the indispensable basis for the application of all others - validity and reliability. Only by applying those principles in the process of knowledge assessment, the socially expected function of the assessment process in vocational education of future healthcare professionals - to be an objective indicator of a graduate student's acquired competence - can be achieved.

## **Conflict of interest**

Authors have no conflict of interest to declare.

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# Dokimološki utemeljeno vrednovanje znanja u strukovnom obrazovanju zdravstvenih radnika

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## Sažetak

*Raznolikost nastavnoga plana i programa u stručnim predmetima zahtijeva primjenu različitih didaktičko-metodičkih pristupa poučavanju, a samim tim i različitih metoda ocjenjivanja znanja studenata. Objektivno ocjenjivanje znanja imperativ je kvalitetnoga strukovnog obrazovanja zdravstvenih radnika. U vrednovanju napretka studenata i konačnoj procjeni njihovoga znanja, uobičajeno se koriste i sumativne i formativne metode, tijekom ili nakon pojedinoga nastavnog tečaja. Moderno visoko obrazovanje uvjetuje na objektivnosti i znanstvenoj utemeljenosti procesa vrednovanja, što je glavni razlog zašto je didaktička dokimologija u posljednjim desetljećima konačno dobila zasluženo mjesto u pedagoškoj praksi. Cilj je ovoga rada naglasiti važnost bezuvjetne primjene znanstvenih načela u evaluaciji znanja studenata, kritički analizirati elemente postojećih objektivnih metoda ocjenjivanja u strukovnom obrazovanju zdravstvenih radnika te naglasiti društveni i profesionalni značaj studentove završne ocjene, koja bi trebala biti nedvosmislen pokazatelj stečenih profesionalnih vještina diplomiranoga studenta zdravstvenih znanosti.*

**Ključne riječi:** *formativna procjena znanja; sumativna procjena znanja; vještine; završna ocjena; zdravstvene znanosti.*

## Uvod

Zdravstvene znanosti, uključujući sestrinstvo, fizioterapiju, nutricionizam, primijenjenu medicinsku radiologiju, primaljstvo i druge, predstavljaju skupinu relativno mladih primijenjenih medicinskih disciplina koje se konceptualno temelje ne samo na medicini, već i na znanstvenim spoznajama iz drugih humanističkih znanosti - pedagogije, psihologije i sociologije (Kovačević i Dobrašinović, 1999; Tijanić i sur., 2010). Zdravstveni profesionalci koji nisu liječnici najčešći su zdravstveni radnici u zdravstvenim sustavima diljem svijeta; na globalnoj razini oni čine gotovo tri četvrtine svih zdravstvenih radnika, uključenih u sve tri razine sveobuhvatne zdravstvene skrbi - primarnu, sekundarnu i tercijarnu. Prvostupnik/ca primijenjenih znanosti najčešći

je akademski stupanj u obrazovanju iz različitih područja zdravstvenih znanosti, više fokusiran na kliničku ili preventivnu praksu, nego na znanstvenu teoriju, što omogućuje završenim studentima da se pridruže profesionalnoj djelatnosti odmah nakon završetka preddiplomskoga studija (Arsić-Komljenović i sur., 2012; United States Department of Labor, 2018). Očekuje se da diplomirani student zdravstvenih znanosti stekne kompetencije za primjenu teorijskih znanja, kliničkih ili preventivnih vještina te vještinu primjerene profesionalne komunikacije za obavljanje svoje profesionalne djelatnosti.

Osnovni ciljevi nastavnih kurikula u području primijenjenih zdravstvenih znanosti su sljedeći (Faculty of medicine Novi Sad, 2018):

1. osposobiti studente da neovisno, učinkovito i odgovorno obavljaju profesionalnu skrb, temeljenu na etičkim principima i holističkim pristupima pojedincima kojima je pomoć potrebna, u raznim područjima zdravstvene skrbi
2. osposobiti studente za primjenu stečenih teorijskih znanja i vještina u svim oblicima skrbi o pacijentima, uključujući profesionalne aktivnosti za poboljšanje zdravlja, prevenciju bolesti i promicanje zdravlja
3. osposobiti studente da primjenjuju profesionalnu njegu u ustanovama primarne zdravstvene zaštite, općim i specijaliziranim bolničkim ustanovama, rehabilitacijskim centrima i ustanovama socijalne skrbi, poštujući razlike u kulturi, religijskoj te etničkoj pripadnosti, seksualnoj orijentaciji i drugim aspektima života
4. osposobiti studente za pružanje zdravstvene skrbi utemeljene na dokazima
5. osposobiti studente za upravljanje u zdravstvenom sustavu.

Uzimajući u obzir prethodno spomenute ciljeve nastavnih kurikula, razumljivo je da vrednovanje stečenih znanja ima izuzetno važnu ulogu u procesu poučavanja zdravstvenih znanosti. Suvremeno strukovno obrazovanje zdravstvenih radnika usmjereno je na ishode učenja koji su precizno determinirani obrazovnim standardima, kao i na stjecanje stručnih kompetencija koje će omogućiti da se diplomirani studenti aktivno uključe u profesionalne aktivnosti. Usmjerenost obrazovnoga procesa na ishode učenja posljedično je dovela do reorganizacije i racionalizacije evaluacije znanja, koja se danas smatra sastavnim dijelom interaktivnoga nastavnog procesa. Procjena znanja studenta ne može se promatrati samo kao formalno dodjeljivanje ocjena za znanje pokazano na ispitu, već kao svakodnevna aktivnost nastavnika koja je u funkciji potpore procesu učenja. Cijeli nastavni proces mora biti fokusiran na povratne informacije od studenta koji bi trebao razumjeti svaki prethodno postavljeni ishod učenja i kriterije za procjenu uspjeha budući da je to osnovni preduvjet za učinkovito praćenje napretka tijekom studija. Raznolikost nastavnih planova i programa u stručnim predmetima zahtijeva primjenu različitih didaktičko-metodičkih pristupa poučavanju, a samim tim i različitih metoda vrednovanja znanja studenata. Objektivno, racionalno, sveobuhvatno i znanstveno dokimološki utemeljeno vrednovanje znanja vrlo je značajan aspekt suvremenoga strukovnog obrazovanja koje je prilagođeno stvarnim potrebama studenata te praktičnim ciljevima obrazovanja. Treba napomenuti da je

adekvatan način procjene znanja jedan od ključnih elemenata u osiguravanju kvalitete strukovnoga obrazovanja jer se nadgledanjem i evaluacijom postignuća zadanih ishoda aktivno doprinosi poboljšanju cjelokupnoga nastavnog procesa i organizacije obrazovnoga sustava države.

## **Načela dokimološki utemeljenoga vrednovanja znanja u strukovnom obrazovanju zdravstvenih radnika**

Procjena znanja sastavni je dio obrazovanja od samog početka ovoga društvenog fenomena, ali još je uvijek i njegov najkonzervativniji dio. Uz to, ocjenjivanje znanja studenata iznimno je osjetljivo područje nastavnoga procesa, ne samo u pedagoškom, već i u psihološkom smislu te u subjektivnoj percepciji procesa studiranja svakog studenta ponaosob. Od bolonjske reforme sveučilišnoga obrazovanja do današnjih dana, pozornost je sve više usmjerena na racionalnost, ciljeve i objektivnost procjenjivanja znanja studenata, nego što je to bio slučaj u prošlosti. Moderno sveučilišno obrazovanje inzistira na objektivnosti i znanstvenom utemeljenju procesa vrednovanja, što je ujedno i glavni razlog zašto je didaktička dokimologija u posljednjim desetljećima konačno dobila zasluženo mjesto u sveučilišnoj pedagoškoj praksi (Ranković-Vasiljević, 2003; Tascovici, 2008).

Didaktička dokimologija (*dokime*, gr. – prosuđivati; *logos*, gr. - znanost) je pedagoška disciplina koja ima za cilj donošenje objektivnoga suda u nastavnom procesu ili, pojednostavljeno, dokimologija je znanost o ispitima i vrednovanju znanja. Uzimajući u obzir izvornu definiciju ovoga pojma, konačna se presuda mora temeljiti na pouzdanim činjenicama, inače neće biti objektivna, već samo slučajna, subjektivna pojava. Slijedom toga, dokimološko vrednovanje može se shvatiti kao postupak prikupljanja relevantnih činjenica o stečenim znanjima, čime predavač stvara temelj za svoju konačnu prosudbu o studentu – završnu ocjenu. Bazično, didaktička se dokimologija bavi znanstvenim vrednovanjem znanja putem detekcije dobrih i loših praksi, a sve u cilju konsolidacije dosadašnje te poboljšanja buduće pedagoške prakse (Geuye, 2002).

Manje je poznato da predavači zdravstvenih znanosti vjerojatno primjenjuju znatno više dokimoloških principa u evaluaciji znanja studenata, u usporedbi s nastavnicima nekih drugih stručnih predmeta kojima pedagogija i srodne znanosti također nisu primarno područje njihovoga bazičnog obrazovanja. Razlog za ovakvu pretpostavku leži u činjenici da se pedagogija, kao i didaktika i metodika nastave različitih zdravstvenih znanosti, diljem svijeta proučavaju u većini sveučilišnih ustanova sa studijskim programima za zdravstvene djelatnike. Proučavanje osnova didaktičke dokimologije tijekom zdravstvenih studija može se tumačiti specifičnošću obrazovanja zdravstvenih djelatnika i profesionalnim potrebama svih zdravstvenih profesija. Korištenjem dokimoloških metoda vrednovanja, predavač minimizira mogućnost isključivog oslanjanja na vlastito iskustvo i subjektivne kriterije u ocjenjivanju znanja studenata. Povećanje kvalitete temeljna je svrha svake vrste ocjenjivanja u nekoj humanoj aktivnosti.



Redovita uporaba dokimoloških načela u ocjenjivanju znanja studenata zdravstvenih znanosti trebala bi pridonijeti ne samo ukupnom poboljšanju nastavnoga procesa, objektivnijem klasificiranju studenata, razvoju kritičkoga mišljenja te otklanjanju problema u učenju kod studenata, već i uklanjanju nedostataka u profesionalnoj djelatnosti samog predavača (Ranković-Vasiljević, 2003).

U usporedbi s drugim znanostima, procjena znanja tijekom studija zdravstvenih znanosti značajno se razlikuje zbog specifičnosti obrazovnih ciljeva te zbog objektivno malih mogućnosti predavača da toleriraju studentske pogreške ili neznanje. Primjera radi, studenti sestrištva moraju znati sve predviđene korake u obavljanju nekog postupka njege, i teorijski i praktično, u suprotnome, oni mogu ugroziti pacijenta, ozlijediti ih, izložiti ih infekciji ili bilo kojoj drugoj vrsti neželjenih komplikacija. No, unatoč svim navedenim specifičnostima, evaluacija stečenoga znanja studenata uvijek bi se trebala temeljiti na sljedećim dokimološkim načelima:

1. univerzalnost - svi očekivani aspekti nastavnoga plana i programa trebaju biti obuhvaćeni vrednovanjem znanja
2. kontinuitet - ocjenjivanje znanja studenata treba provoditi kontinuirano tijekom nastavnoga tečaja, a ne samo na završnom ispitu (to je najproblematičniji aspekt sveučilišnoga obrazovanja)
3. objektivnost - završna ocjena treba odgovarati stvarnom znanju studenta (ovaj aspekt može se ostvariti samo ako postoji stabilan kriterij ocjenjivanja očekivanoga kataloga znanja studenta)
4. nepostojanje „trećih“ čimbenika u procjeni znanja - na ocjenu znanja ne bi trebao utjecati ni jedan čimbenik koji nije predmet trenutačne procjene
5. racionalno korištenje vremena potrebnoga za provjeru znanja studenata - svi studenti imaju neotuđivo pravo prezentiranja vlastitoga znanja u jednakim planiranim vremenskim okvirima
6. pravednost - završna ocjena mora se temeljiti na stvarnom postignuću i znanju studenta, bez utjecaja predrasuda i drugih subjektivnih čimbenika
7. javnost ocjenjivanja - ocjena studenta mora biti javna, ne postoji pedagoški opravdan razlog za tajnost završne ocjene; uz to, sve razloge za završnu ocjenu uvijek treba objasniti studentu (Geuye, 2002; Ranković-Vasiljević, 2003).

Procjena znanja utemeljena na kompetencijama koncept je koji se uspješno primjenjuje u svim relevantnim obrazovnim sustavima koji su usmjereni na produkciju visoko kvalificiranoga stručnog kadra. Dokimološka metodologija ove vrste vrednovanja znanja osigurava relevantnost i pouzdanost obrazovnoga sustava u strukovnom obrazovanju, utemeljenu na jasnoj povezanosti sadržaja ocjenjivanja i kompetencija propisanih postojećim standardom određene stručne kvalifikacije (Glišić i Jadrijević-Mladar, 2013). Jedan od najznačajnijih ciljeva obrazovanja u strukovnom obrazovanju zdravstvenih radnika je stjecanje određenih stručnih kompetencija koje su relevantne za budući angažman diplomiranih studenata u različitim zanimanjima zdravstvene struke. Profesionalne kompetencije kombinacija su vještina, znanja, stavova,

vrijednosti, sposobnosti i prosudbi koje omogućuju zdravstvenom stručnjaku da se na odgovarajući način bavi profesionalnim aktivnostima. Kompetencija ukazuje na dovoljnu količinu znanja i vještina koje određena osoba posjeduje i koja omogućava provođenje profesionalnih aktivnosti u širokom rasponu radnih situacija (Glišić i Jadrijević-Mladar, 2013; Šepec, 2011). U praktičnom smislu to znači da kompetencija predstavlja stvarnu sposobnost određene osobe za obavljanje određene profesionalne aktivnosti (Matijević, 2011). Definiranje profesionalnih kompetencija izuzetno je važan dio vrednovanja studentskih postignuća - prvi korak u funkcionalnom ocjenjivanju znanja je prepoznavanje ishoda učenja i definiranje kriterija na temelju njih (Ilić, 2014). Bez stjecanja stručnih kompetencija, strukovno obrazovanje ne bi imalo smisla, što znanstveno utemeljenu procjenu znanja studenata čini još važnijom no što se to čini u prvome trenutku.

Organiziranjem procesa poučavanja, predavači zdravstvenih znanosti moraju prikupljati podatke o stupnju stjecanja kompetencija, stečenom znanju i profesionalnim vještinama, zanimanju studenata za neka područja stručnoga rada i izobrazbe, demonstriranoj neovisnosti u praktičnim aktivnostima, razvoju komunikacijskih vještina te drugim aspektima napredovanja i praćenja rezultata učenja kod studenata (Matijević, 2011). Kao što je već spomenuto, vrednovanje znanja studenata ima konačni, vidljivi rezultat - završnu ocjenu. Ova ocjena ima više funkcija: informirati o razini znanja koju je student stekao (teorijskoga ili praktičnoga, ovisno o predmetu), ukazati na sve moguće razloge stjecanja određene ocjene, pokazati potencijalni napredak studenta u određenom profesionalnom području, motivirati studenta za još bolje učenje, pobuditi interes studenta za određeno znanstveno ili stručno područje i, na kraju, ispuniti administrativnu funkciju te omogućiti studentu daljnju izobrazbu. U sveučilišnom obrazovanju zdravstvenih djelatnika trenutačno se koriste različiti načini za utvrđivanje završne ocjene studenata. Međutim, u većini zemalja u svijetu postoje dvije vrste ocjene znanja studenta: numerička (abecedna) i opisna (Mešter, 2006; Ranković-Vasiljević, 2003).

Numeričko ocjenjivanje najstariji je, a ujedno i najviše kritiziran i analiziran tip ocjenjivanja znanja studenata u cijelom svijetu (Berg, 2005; Sadler, 2010). Kritike ove metode ocjenjivanja uglavnom se odnose na subjektivnost ispitivača, objektivnost ocjenjivanja, kao i na preciznost instrumentarija za ocjenjivanje. Kao i u bilo kojem drugom mjerenju, u procesu mjerenja znanja iznimno je važna velika preciznost mjernoga instrumenta (Durm, 1993). Međutim, u odnosu na ranije pedagoške prakse, primjena bolonjske deklaracije značajno je povećala objektivnost procjene znanja studenata. Za razliku od vremena prije ove deklaracije, kada je ocjena studenta uglavnom bila rezultat subjektivne prosudbe ispitivača na usmenom ispitu, konačna brojčana ocjena sada je rezultat zbroja bodova dobivenih na temelju ispunjavanja predispositivnih obveza (do 50 %), i bodova dobivenih na završnom testu (ostalih 50 %). Ova vrsta konačnoga ocjenjivanja koristi se za većinu predmeta koji su dio nastavnih kurikula zdravstvenih znanosti.

Opisni način ocjenjivanja obično se koristi pri ocjenjivanju poznavanja praktičnih vještina i ovladavanja profesionalnim kompetencijama. Općenito, opisni način ocjenjivanja znanja vrlo je prikladan u svim primijenjenim znanostima te samim tim i u svim zdravstvenim znanostima, ponajprije zbog njegova informativnoga karaktera. Opisnom ocjenom može se objektivno procijeniti znanje studenta o teorijskim osnovama za određenu praktičnu vještinu, preciznost u radu, razvoj uspostave vještina terapijskoga odnosa, stupanj pravilnosti u praktičnim aktivnostima studenata, točnost studenta te većina drugih parametara relevantnih za zdravstvene profesije (Tijanić i sur., 2010; Šepec, 2011). Svakako ne treba zaboraviti da opisno ocjenjivanje zahtijeva jedinstven način opisivanja znanja studenata unutar iste sveučilišne institucije, zbog toga je većina fakulteta zdravstvenih znanosti razvila vlastite popise za provjeru znanja, utemeljene na kvalitativnim opisima znanja ponuđenim na nekoj vrsti metričke ljestvice, za svaki obrazovni aspekt koji se ocjenjuje.

## **Objektivne metode vrednovanja znanja u strukovnom obrazovanju zdravstvenih radnika**

Kvaliteta i pouzdanost procjene znanja važni su čimbenici koji doprinose povjerenju javnosti u obrazovni sustav (Ministry of education, science and technological development of Serbia, 2008). Kako bismo bolje razumjeli važnost procesa vrednovanja znanja u obrazovanju budućih zdravstvenih radnika, potrebno je osvrnuti se na suštinu zdravstvene profesije. Sve su zdravstvene profesije humanistička, pomagačka zanimanja. Budući da se sve zdravstvene profesije izravno bave zdravljem ljudi i ljudskim životom, praktički nema mnogo prostora za pogreške tijekom obavljanja profesionalnih aktivnosti (Čirić i sur., 2018). Očekuje se da diplomirani studenti zdravstvenih znanosti imaju i potrebna znanja i stručne kompetencije koje će im omogućiti izravno uključenje u profesionalne aktivnosti, što je ujedno i glavni razlog inzistiranja na visokoj razini objektivnosti u ocjeni znanja tijekom strukovnoga obrazovanja budućih zdravstvenih radnika. Objektivno ocjenjivanje znanja imperativ je kvalitetnoga strukovnog obrazovanja. U vrednovanju napretka te konačnoj procjeni znanja studenata, sumativne i formativne metode uobičajeno se koriste tijekom ili nakon tečaja pojedinoga predmeta.

Formativno vrednovanje provodi se u određenim trenucima tijekom tečaja nekog nastavnog predmeta, kako bi se dobila povratna informacija o napretku studenata u određenom obrazovnom ili profesionalnom području, nastojeći da se poboljša postignuće studenata putem primjene određenoga načina vrednovanja koje istodobno može podržati i specifične potrebe studenata (Theall i Franklin, 2010). Deskriptivno ocjenjivanje izuzetno je važno u obrazovanju zdravstvenih radnika jer pomaže studentima u boljem razumijevanju i kritičkom razmišljanju o određenom predmetu, vještini ili drugim aspektima stručnoga obrazovanja, uz istodobno povećanje ukupne kvalitete učenja (Koh, 2010). Stalnim pružanjem povratnih informacija, sve metode formativnoga vrednovanja znanja pomažu studentima da postanu više motivirani, ali i da ostvare očekivane nastavne ciljeve. Poticanje ove vrste procjene znanja jedna je od

najvažnijih strategija u izgradnji profesionalnih vještina kod studenata zdravstvenih znanosti širom svijeta, ne samo u tradicionalnom, sveučilišnom obrazovanju, već i na platformama za e-učenje za zdravstvene radnike (Wolters Kluwer: Lippincot Nursing Education, 2018). Predavačima i instruktorima u procesu poučavanja strukovnih predmeta, dostupne su različite metode formativnoga ocjenjivanja:

1. diskusije u učionici - često korištena metoda koja promiče interaktivnu komunikaciju između predavača/instruktoru i studenata kako bi se kritički razmijenila i ocijenila različita stajališta o temama učenja, te studente potakli da uče jedni od drugih
2. crtanje mape koncepta - metoda koja potiče studente da kritički analiziraju i interpretiraju razinu razumijevanja teme koja se trenutačno proučava
3. jednominutne zadaće pisanja refleksija - kratka metoda za izvođenje u učionici koja se temelji na pisanom bilježenju dojmova i razmišljanja o temi koja se trenutačno proučava
4. pisanje do pet opisnih rečenica - ova se metoda temelji na utvrđivanju fokusa proučavane teme
5. zadavanje domaćih zadaća - ova metoda potiče studente da kod kuće napišu kratki kritički osvrt na temelju relevantnih činjenica vezanih uz temu koja se proučavala
6. tjedni/ mjesечni znanstveni kviz - vrlo popularna metoda stimuliranja učenja zasnovana na pitanjima s višestrukim izborom koja se odnose na najvažnije činjenice o prethodno raspravljenim temama (Yale Center for Teaching and Learning, 2018).

Međutim, neki istraživači sugeriraju da su pripreme i naponi studenata uvijek bolji kada se procjena znanja obavlja za sumativne svrhe (Duers i Brown, 2009). Sumativno vrednovanje znanja provodi se na kraju modula ili kolegija i ima izvanrednu obrazovnu i društvenu važnost koja se uglavnom temelji na činjenici da ova vrsta ocjenjivanja daje vidljiv javni rezultat - završnu ocjenu, koja indicira razinu stečene akademske i praktične kompetencije studenta u nekom znanstvenom ili stručnom području. Sumativna (završna) ocjena u obrazovanju zdravstvenih radnika pruža pojedinačne dokaze o akademskim postignućima koja su potrebna za buduće zaposlenje ili daljnju izobrazbu (Ministry of education, science and technological development of Serbia, 2008). Kako bi se steklo i zadržalo povjerenje javnosti u sumativno ocjenjivanje znanja, neophodno je u vrednovanju koristiti objektivne, standardizirane postupke, temeljene barem na dva osnovna dokimološka načela: validnosti i pouzdanosti (Ministry of education, science and technological development of Serbia, 2008; Cizek, 2009). Postoji nekoliko vrsta objektivnih sumativnih metoda koje se često koriste u strukovnom obrazovanju zdravstvenih radnika: ocjenjivanje znanja (test s višestrukim izborima - *Item*, test davanja kratkih odgovora na postavljena pitanja, esejski tip testa) te ocjenjivanje profesionalnih vještina (tradicionalni/konvencionalni praktični ispit i objektivni strukturirani klinički ispit - *Objective Structured Clinical Examination* - OSCE) (Gogate, 2012; Obizoba, 2018).

*Testovi s višestrukim izborom* (poznati kao *Item*) često su korištena metoda sumativne procjene znanja studenata, posebice na strukovnim studijima. Unatoč mnogim kritikama takve vrste ocjenjivanja, nemoguće je osporiti višu razinu objektivnosti i nepristranosti ove vrste ocjenjivanja u odnosu na usmeni ispit, u dokimološkom smislu. Posljednjih desetljeća ova vrsta ocjenjivanja intenzivno se koristi u izobrazbi zdravstvenih radnika i danas igra temeljnu ulogu u oblikovanju obrazovnih programa jer može biti djelotvoran i učinkovit način za procjenu ishoda učenja (Brame, 2013). Međutim, iako su testovi s višestrukim izborom najčešće korištena metoda ocjenjivanja (uglavnom teorijskoga) znanja, nema dovoljno podataka o njihovom formatu, strukturi, valjanosti i pouzdanosti u kontekstu obrazovanja zdravstvenih radnika (Considine i sur., 2005). „*Item* s višestrukim izborom sastoji se od problema, poznatog kao *stem*, i popisa predloženih rješenja, poznatih kao *alternative*. Alternativa se sastoji od jedne ispravne ili najbolje alternative, što je odgovor na postavljeno pitanje, i pogrešnih ili inferiornih alternativa, poznatijih kao *distraktori*” (Epstein, 2007). Da bi dobio pravi odgovor, student mora kritički razmišljati i donijeti zaključak na temelju valjanosti ponuđenih i poznatih činjenica o spomenutoj temi. Popularnost testova s višestrukim izborom u obrazovanju zdravstvenih radnika može se objasniti mogućnošću osiguravanja ispitnih tema koji obuhvaćaju sadržaje iz mnogobrojnih područja što se mogu primijeniti u kratkom roku i, konačno, to je jednostavan način ocjenjivanja velikoga broja studenata (Epstein, 2007).

*Test davanja kratkih odgovora na postavljena pitanja* metoda je sumativnoga ocjenjivanja koja se temelji na zahtijevanju pravoga odgovora na otvorena pitanja sadržana u testu. Praktično, od studenta se traži da navede riječ, frazu, broj ili simbol koji je potreban za dovršavanje izjave ili davanje odgovora na pitanje (Fraenkel i sur., 1993). Ova vrsta testiranja znanja studenata obično se koristi na završnim ispitima za ocjenu temeljnoga i dubljega znanja, ovisno o složenosti pitanja. Za razliku od testa s višestrukim izborom, ova metoda ocjenjivanja temelji se više na objektivnom stjecanju znanja jer ne postoji mogućnost nagađanja o pravom odgovoru. Također, nekoliko studija iz područja kognitivne psihologije potvrdilo je da uporaba testova davanja kratkih odgovora u procjeni znanja potiče bolju retenciju znanja u usporedbi s onima koji zahtijevaju prepoznavanje, poput testova s višestrukim izborom (Butler i Roediger III, 2007; Larsen i sur., 2008).

*Esejski tipovi testa* vrlo su česta vrsta pismenoga ispita iz bioetike, medicine i drugih zdravstvenih znanosti (Epstein, 2007). S obzirom na posebne potrebe strukovnoga obrazovanja zdravstvenih radnika, provođenje testiranja esejskoga tipa vrlo je moćan instrument za sumativno ocjenjivanje znanja u pedagoškom i psihološkom smislu, budući da mjeri više razine misaonoga procesa kod studenata, poput kritičke analize i sinteze, kao i usporedbe, ocjenjivanja i zaključivanja (Lemons i Lemons, 2013; Stanger-Hall, 2012). Metodički, esej je studentova pismena analiza, odnosno evaluacija neke teme ili problema o kojoj je predavano tijekom nastave. Obično postoje dvije vrste

eseja koji se koriste u sumativnom ocjenjivanju studenata: zatvoreni i otvoreni (sa ili bez ograničenja koje postavlja ispitivač). Korištenjem esejskoga tipa testiranja, ispitivač može procijeniti sposobnost studenata da se prisjete, organiziraju i integriraju misli i ideje, sposobnost kritičkoga razmišljanja te sposobnost komuniciranja i vlastitoga izražavanja pisanjem (Kurdi, 2015; Lemons i Lemons, 2013).

*Tradicionalni/konvencionalni praktični ispit* vjerojatno je najstarija metoda ocjenjivanja profesionalnih vještina u obrazovanju liječnika i drugih zdravstvenih radnika koja podrazumijeva procjenu učinkovitosti studenta u praktičnoj primjeni standardiziranoga profesionalnog postupka na stvarnom, živom, hospitaliziranom pacijentu (Ranković-Vasiljević, 2003). Posljednjih godina ovaj se način procjene vještina često kritizirao iz više razloga: uslijed etičke (ne)prihvatljivosti, ograničene izvedbene mogućnosti ispitivanja, neadekvatne suradnje pacijenata sa studentima, kao i subjektivnoga utjecaja ispitivača prilikom ocjenjivanja (Hasan i sur., 2009; Zayyan, 2011). Međutim, ova metoda ocjenjivanja i dalje je vrlo popularna u mnogim sveučilišnim zdravstvenim ustanovama, prvenstveno zbog sposobnosti uvida u vještine studenata u realnoj situaciji i realnom okruženju. Subjektivnost ispitivača značajno je smanjena korištenjem kontrolnih lista za provjeru tijekom ispitivanja pomoću kojih se proceduralno prati izvedba svake vještine koja se ocjenjuje. Na kraju, treba naglasiti da tradicionalne/konvencionalne praktične ispite treba provoditi samo u nastavnim kliničkim bazama, uz prethodno dobiveno pismeno odobrenje rukovodstva bolnice i pismeni pristanak pacijenta (Gogate, 2012).

*Objektivni strukturirani klinički ispit (Objective Structured Clinical Examination – OSCE)* je višestran, precizan, objektivan i ponovljiv višenamjenski evaluacijski instrument, prilagođen za ocjenu profesionalnih vještina u kliničkom okruženju i utemeljen na objektivnom ispitivanju izravnim promatranjem (Zayyan, 2011). Ova vrsta ocjenjivanja sposobnosti može se koristiti i za sumativne i za formativne procese vrednovanja. Korištenjem OSCE-a u ocjenjivanju vještina, sposobnosti studenta ocjenjuje tim ispitivača, zaduženih za 15-16 različitih interaktivnih „pacijent-stanica“ tijekom ispitivanja. Ove stanice mogu biti različite, ovisno o iskustvu studenata i prirodi ocjenjivanja (Ming-Chen i sur., 2014). Sve „pacijent-stanice“ kreirane su tako da upoznaju studente s različitim kliničkim scenarijima. Nakon svake stvarno životne interakcije s modelima pacijenata („standardizirani pacijenti“ koje igraju profesionalni glumci), studenti su dužni ispuniti bilješku o pacijentu na svakoj „stanici“. OSCE se zadnjih 40 godina uspješno koristio za ocjenu vještina koje su najkritičnije ili ih je nemoguće izvesti u tradicionalnom praktičnom ispitu, uključujući sposobnost interpretacije podataka, rješavanje problema, edukaciju, komunikaciju i snalaženje u nepredvidivom ponašanju pacijenata (Jason i sur., 1971; Ming-Chen i sur., 2014).

## Zaključak

Evaluacija znanja uvijek je bila posljednja faza složenoga nastavnog procesa, nastavni mikroelement u kojem se svi ostali elementi i faze poučavanja moraju povezati u skladan

i jedinstven spoj. Iz znanstvene discipline koja je dugo bila nepravедно zanemarena, dokimologija je napokon dobila praktičnu primjenu i zaslužila je mjesto u organizaciji i vrednovanju sveučilišne nastave u posljednjim desetljećima. Primjena dokimoloških principa u ocjenjivanju znanja osobito je vidljiva u strukovnom obrazovanju; međutim, glavni razlog za ovu pojavu trebalo bi tražiti u činjenici da je ovaj oblik visokoga obrazovanja uglavnom usmjeren na kompetencijsko učenje. Očekivano je da će studenti zdravstvenih znanosti tijekom školovanja steći profesionalne vještine koje će moći odmah primijeniti u profesionalnoj praksi nakon svršetka studija. Iako se može steći dojam da se funkcije ocjenjivanja utemeljenoga na kompetencijama ne razlikuju od funkcija drugih metoda vrednovanja znanja, ovom metodom ističe se neovisni rad studenta i demonstraciju stečenih znanja i vještina. Dakle, može se zaključiti da intenziviranje interaktivnoga odnosa nastavnika i studenata, aktiviranje određenih segmenata samog procesa učenja, kao i istodobna uporaba nekoliko različitih načina i instrumenata za procjenu znanja studenata čine osnovne karakteristike kompetencijski utemeljenoga ocjenjivanja u strukovnom obrazovanju zdravstvenih radnika. Svi pobrojani aspekti ocjenjivanja kao integralnoga dijela obrazovnoga procesa u biti imaju isti cilj: najbolju moguću pripremu studenta za učinkovito funkcioniranje u sustavu zdravstvene i socijalne skrbi u budućnosti. Sukladno tome, preporuka je da se tijekom stvaranja kurikula studijskoga programa izradi plan za buduće ocjenjivanje znanja, kao i kriteriji, metode i instrumenti za učinkovitu procjenu stečenih kompetencija, uvijek na temelju prethodno planiranih ishoda učenja. Završne ocjene imaju iznimno javno značenje u današnje vrijeme te bi trebale transparentno upućivati na razinu znanja i profesionalne kompetencije stečene tijekom studija. S obzirom na sve navedeno, lako se može zaključiti da se konačno vrednovanje znanja studenata mora u potpunosti temeljiti na dokimološkim načelima ocjenjivanja, ali posebice na dva koja čine neophodan temelj za primjenu svih ostalih načela - validnost i pouzdanost. Samo primjenom tih načela u procesu provjere znanja, može se postići društveno očekivana funkcija ocjenjivanja u strukovnom obrazovanju budućih zdravstvenih radnika - što je objektivan pokazatelj stečene kompetencije diplomiranoga studenta.