

Implementation of E-assessment in Higher Education

Hanna M. Shalatska ¹[0000-0002-1231-8847], Olena Y. Zotova-Sadylo ^{1*}[0000-0002-9474-016X],
Olexandr Y. Makarenko ²[0000-0002-3020-0658] and Larysa S. Dzevytska ²[0000-0002-9093-7635]

¹ Kryvyi Rih National University, 11, Vitalii Matusevych Str., Kryvyi Rih, 50027, Ukraine
shalatska@i.ua, hjzotova74@ukr.net

² Donetsk Law Institute, 21 Stepan Teliha St., Kryvyi Rih, 50065, Ukraine
a.y.makarenko@gmail.com, dsevickayalarisa@gmail.com

Abstract. The purpose of the study is to develop the methodical recommendations for test-designers to cope with challenges of organizing on-line assessment process. In order to achieve this goal we have to reveal the strengths and weaknesses of e-assessment activities based on analysis of the universities practice. To find out students' attitude to the issue of the study we have drawn up the questionnaire. The survey results confirm that e-assessment is rated as priority activity by learners thanks to individual approach to teaching/learning process, easily accessible and fast feedback, as well as interactive methods of implementation. Reviewing practical experience of Kryvyi Rih National University (KNU) and Donetsk Law Institute of the Ministry of Internal Affairs of Ukraine (DLI) and summarizing statistical data of the survey we have developed methodical support for designing e-assessment activities which involves: to determine intended recipients and the purpose of testing; select appropriate instruments and e-platform; specify forms of feedback; clarify the tasks; provide knowledge base for operating e-tests etc. Despite plenty of studies in this domain the test-designers and test-takers face to typical difficulties while operating e-assessment, and there is lack of research providing methodical practicalities in this field. To address learners' and lecturers' needs we have developed the methodical recommendations, which might be used in the drafting of e-assessment tests for students of different specialisms.

Keywords: E-assessment, E-learning, Google Class, Moodle, Higher Education

1 Introduction

Problem statement. Technology is an integral part of student lives they use computers, mobile phones and the Internet every day. Nowadays it is important to use Information and Communication Technologies (ICT) for teaching, learning and assessment. E-learning has become an intrinsic element of prospective specialists' training. This approach contributes to provide basic knowledge and to improve awareness in any domain to the same extent. To compile qualitative, valid tests and develop accurate evaluation tools are among the main outstanding challenges. The text should have a measurable outcome; there should not be any flows as regards the content [18]. Nowadays there are

a lot of studies devoted to e-learning in the higher education system. E-assessment is considered to be an essential constituent of e-learning, which is commonly adopted in situations of necessity quick and effective testing of knowledge in large academic groups for example. This is regarded as a demanding, time-consuming and labour-intensive method of e-learning. But when tests are carefully designed, preferential advantages obtain both learners and teachers. E-assessment has become particularly relevant in view of global quarantine with regard to the spread of the virus around the world. At one moment a huge amount of institutions lost access to traditional in-class studying. In current situation e-learning and e-assessment are literally the only way to continue training, to measure knowledge and ensure that learning outcomes are met.

Analysis of recent research and publications. The scholars have concluded that online assessment is a significant technological advancement that should be involved in the educational system and enhance the current evaluating system. The scientific papers are dedicated to the principles of e-learning (Buzzetto-More, 2007; Pinhey, 2007), computer simulation and modelling in professional training (O. Teplytskyi, I. Teplytskyi, S. Semerikov, V. Soloviov, 2015) and computer-based assessment strategies (Miller, 2012). The scientists investigate the impact of e-assessment on the education (Vipin Singh, 2019), provides the guidance to teachers on how to construct e-tests (Zabaleta, 2013; Abdelkader, Boumiza, Braham, 2014; Mostert, 2012) and e-assessments (Forester, 2007; Pinsonneault, Kraemer, 1993; Koneru, 2017), study their attitudes towards the use of e-assessment (Tuparova, Goranova, Voinohovska, Asenova, Tuparov, Gyudzhenov, 2016), define the advantages and challenges of its using (Alruwais, Wills, and Wald, 2018; Upasana Gitanjali Singh, 2014). However, despite a considerable amount of studies, the methodological recommendations for efficiency in organizing e-assessment in higher education have not been provided. The academic literature on the subject has revealed the emergence of several advantages of e-assessment. For example, N. Alruwais, G. Wills, and M. Wald (2018) note that students prefer online assessment because they can control the process due to friendly interfaces. Besides, e-assessment ensures immediate feedback comparing with paper tests. It, therefore, increases students' motivation. Successful online interaction allows students to demonstrate not just content mastery but the ability to taking it to the higher level of thinking [2]. It helps students in remote areas to learn and assess their results [3]. In terms of universities, the advantages are clear too, i.e. it gives an opportunity to increase the number of students; e-assessment decreases cost for an institution to assess students as the time is reduced; e-assessment is reliable and security-enhanced, it assists to reduce students' cheating [3]. Additional benefits of e-learning and e-assessment are:

- The implementation of active learning strategies [2]
- Solutions for individualizing instruction [2]
- Replicability and accessibility [2]
- Ease of learning management [2].

The article is aimed to examine the practical experience of e-assessment on the examples of Kryvyi Rih National University and Donetsk Law Institute of the Ministry of Internal Affairs of Ukraine and reveal the advantages and disadvantages of this approach. **The outcome of the study** stems from the aim. It should be methodical recommendations for test-designers how to organize effective e-assessment based on analysis

of scientific literature on this subject and currently available e-tests on the universities' e-platforms, and summarizing of the results of the questionnaire for the university students. In order to achieve these outcomes, the following **tasks** are to be solved:

- an overview of recent scientific researches related to e-assessment;
- designing the questionnaire for students to define their experience of using different forms of e-assessment;
- analysis of the questionnaire results and identifying the pitfalls of e-assessment applying;
- examine the experience of using e-assessment in higher education;
- developing methodical recommendations for organizing effective e-assessment.

2 The Theoretical Backgrounds

Analysis of scientific literature was produced in terms of applying existing theories and practical experience. S. Hadjerrouit states that an e-learning model needs to demonstrate what pedagogical principles and learning theories are operating [8, p. 27]. It is really determining factor to realize how to implement the pedagogical theory into practice. Our study is based on the learners'-centered approach. All the tests and quizzes are subjected to meet the learners' needs in the scope of ESP.

In general, the researchers have determined that the life-cycle of e-learning model includes four phases. They are the design phase, the production phase, the deployment and assessment phases [1]. Our study is aimed to analyze the specifications of the last one. Evaluation is a really important phase of both classic in-class instructor-led studying and e-learning as well. In this regard, L. Forester (2007) investigated the differential impact of paper tests, web-based instruction and e-assessment on German culture proficiency of students. She notes that classroom teaching in "...a culture course – and especially assessments such as tests, quizzes, and papers – usually does not meet learners' actual linguistic needs" [6, p. 84]. The reason is a clear misalignment between real-life tasks in this domain and a set of facts which are necessary to complete the standard tests in class. Taking into account these disconnects the researcher has developed the author course on German culture based on German websites for cultural and linguistic information.

As a logical extension of a web-based approach to teaching the scholar has required students to submit all their work as web-sites. In particular, each student has created his own course web-site and posted all homework and projects there. And the benefits are clear because the students obtained new and very important for career promotion skills in web-sites designing, it encourages a more serious and responsible attitude to homework, contributes to the accuracy of facts, grammatical correctness, vocabulary usage, since not only group mates and a teacher could access to their results but everybody around the world.

Spanish researcher F. Zabaleta notes that "...the test-authoring software should provide a flexible array of item types and item capabilities" [21, p. 680]. For example, item feedback, conditional feedback, test evaluation feedback, printing, passing score, ad-

ministration of the test through a network. Meanwhile, B. S. Bloom was correct to assert that the role of an instructor also changed from the classic “sage on the stage” to the “guide on the side” [5, p. 90]. The teacher should explain technical questions, for example how to create frames on a web page and after that, the teacher served as a linguistic consultant [5].

Considering the fact that most of the e-tests have been designed conforming to Bloom's taxonomy principles let us expand on classifying educational objectives and test exercises. Bloom's Taxonomy is conducive to convert the objectives, which the teacher expects to perform, to practical applicable outcomes, which are expected by the learners'. The first (basis) step is *knowledge*. In the terms of evaluation knowledge “...includes those behaviours and test situations which emphasize the remembering, either by recognition or recall, of ideas, materials, or phenomena” [5, p. 62]. B. S. Bloom identifies several types of knowledge: 1) knowledge of specifics (to recall some specific information), 2) knowledge of terminology (specific verbal and non-verbal symbols). It is considered to be the most basic type of knowledge in some domain. There is an implied hierarchy to Bloom's categories, with knowledge representing the simplest level of cognition and the evaluation category representing the highest and most complex level. Teachers can identify the level of chosen learning objectives and create assessments to match those levels. One can write items for any given level. With objectively scored item formats, it is fairly simple to tap lower levels of Bloom's taxonomy and more difficult, but not impossible, to measure at higher levels. On the other hand, test-designers should not worry too much about the fine distinctions between the six levels as defined by B. S. Bloom. For example, comprehension and application are commonly treated as synonymous as it means the ability to apply what is learned that indicates comprehension [13]. Most e-testing theorists and test-designers today pay the most attention to the distinction between the knowledge level and all the rest of the levels.

Bulgarian scholars D. Tuparova, E. Goranova, V. Voinohovska, P. Asenova, G. Tuparov, I. Gyudzhenov have conducted the survey to find out what methods and technological tools for competency assessment apply school teachers of Maths and Informatics in Bulgaria [20]. The results show that the teachers prefer “...traditional assessment methods as Tests, Practical Tasks and Project-based method. Most non-used methods are Method 360 degrees, Portfolio, and Sharing opinion through social networks” [20, p. 2239]. Consequently, the research discloses the fact that e-designers prefer to develop simple lower levels of e-assessment items (according to Bloom's Taxonomy). The scientists make the public one of the reasons for non-using higher-level methods, which has proved to be the lack of knowledge on the method or the belief that this method is not suitable for the subject. Thus, this research has indicated a need for additional methodical support for lecturers who do apply e-learning and e-assessment in practice.

3 Methods

In order to identify whether the students have got enough experience of using different forms of e-assessment the participants were asked to fill out the questionnaire. Firstly, we have developed the questions for the survey. A. Pinsonneault and K. L. Kraemer define a survey as “a means for gathering information about the characteristics, actions, or opinions of a large group of people” [14, p. 77]. Surveys can also be used to assess needs, evaluate demand, and examine impact [15]. The survey enables us to collect the necessary information on students’ attitudes towards using of e-assessment; to mature advantages and disadvantages of these methods and appropriate implementation of the electronic evaluation. The questionnaire was made available on the Internet and redistributed among the students of Kryvyi Rih National University and Donetsk Law Institute of the Ministry of Internal Affairs of Ukraine. We use Google Forms as an instrument to provide and collect regular students’ feedback regarding their learning experience. Dr. R. Haddad and Dr. Y. Kalaani characterize Google Forms as “an integrated web-based application that facilitates the design of online surveys, questionnaires, and quizzes with a user-friendly application programming interface (API)” [7]. The scientists indicate the following benefits of using Google Forms: 1) it has a modular structure which makes creating surveys as easy as adding questions and selecting options such as the type of question, the scale, and the labels; 2) the survey results are stored in a centralized Google Spreadsheet in your Google Drive and can be exported to Excel spreadsheet; 3) Google Forms does not limit the number of survey forms that can be created or the number of students that can participate in these surveys; 4) it allows email notifications whenever a response is submitted; 5) it supports a wide range of question types and options and etc. [7]. Thus, the survey has been placed on Google Forms platform because it enables to get fast feedback, to monitor the progress and analyze the results. There is the link: <https://forms.gle/zYJupAyvBffsuokdA>.

University *

Multi answer

1. Below are methods and forms of e-assessment. Please indicate which forms and methods you have experienced by completing tests or control papers on different subjects at your university by selecting appropriate column.

	Often	Not very often	Never
Multiple choice (There are several answers from which you should choose only one.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short answer (There are open-ended questions that require students to create an answer)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 1. Google Forms

Let us now consider the results of the questionnaire. The total number of respondents is 111 the 1st – IVth year students of KNU and DLI trained for different specialisms, namely computer and software engineering, electrical engineering, mechanical engineering, economics, management, law enforcement, law. At the beginning of the study, students were informed about its goals, and they agreed to cooperate on a voluntary basis.

The first question is aimed to identify which forms and methods of e-assessment students have experienced on different subjects at their universities. Of the 111 respondents who completed the questionnaire, just over half have indicated *multiple choice* (76 respondents), *short answers* (56 respondents) and *presentation* (57 respondents) as the most often used forms of e-assessment. There are highly predictable results because of the teachers remarkably regular use those forms for quick testing of their students' knowledge.

Otherwise, such forms of assessment activity as a case study (*Not often* – 66 respondents, *Never* – 17), self-assessment and peer-review (*Not often* – 54 respondents, *Never* – 13), discussion posts (*Not often* – 61 respondents, *Never* – 13) and portfolio (*Not often* – 36 respondents, *Never* – 36) have appeared to be underestimated by the teachers. The findings of the questionnaire have revealed that crucial number of students has experienced these methods “not very often” or “never”. The reason is self-evident: this is a cumbersome and time-consuming process to develop aforementioned activities for test-designers, on the one hand, and this is labour-intensive and meticulous to complete these assignments for test-takers, on the other hand. It becomes apparent that the results we found have been echoed by the larger-scale study conducted by Bulgarian scholars [20].

This assumption is supported by the answers on the questions as concerns the advantages and disadvantages of the e-assessment methods. Figure 2 below illustrates the breakdown of the students' choices according to the advantages of the most often used electronic evaluation methods.

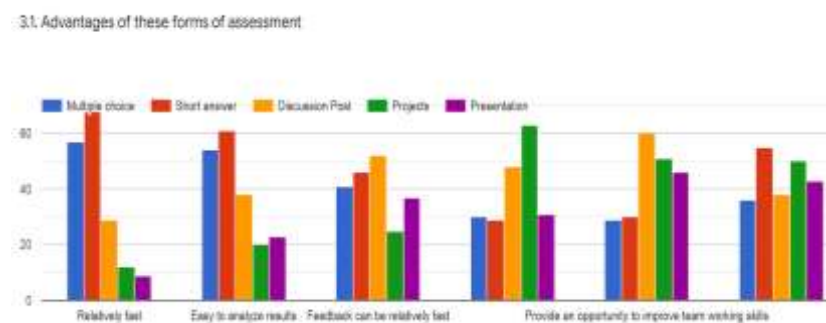


Fig. 2. Advantages of e-assessment methods

It is significant, therefore, the respondents have cited amongst the disadvantages of e-assessment methods lack of accuracy provided by multiple choice (45 answers) and short answers (45 answers) whereas the students may often learn by rote or just guess the answers (59 and 54 answers, respectively).

The next section of the survey is concerned with the problem of students' awareness of the long-run objective of different e-assessment methods. We have addressed the question: *What skills and abilities do these forms of e-assessment contribute to?* Table 1 displays the distribution of skills and abilities among the forms of assessment in the view of the test-takers.

Table 1. The distribution of answers to the question "What skills and abilities do these forms of e-assessment contribute to?"

	Multiple choice	Short answer	Discussion post	Projects	Presentation	Portfolio	Case study	Reflective journals	Practical experiments	Self-assessment peer-assessment
Critical thinking	54	49	54	38	25	33	40	21	58	35
Communicating skills	33	38	54	36	47	23	49	33	44	38
Analytical and research skills	48	33	41	54	43	46	42	46	58	29
Ability to make decisions and solve problems	54	44	51	45	24	37	35	34	52	36
Leadership or management skills	28	27	47	53	42	31	35	29	59	33
Ability to plan, organize and prioritize work	40	29	37	58	42	48	43	36	58	30
Teamwork	47	29	55	54	40	37	35	27	61	40

The single most striking observation to emerge from the data comparison is that a significant number of respondents realize that time- and labour-consuming but creative assessments methods like presentation, portfolio, case study, practical experiments are crucial for improving learners' proficiency. For instance, 58 of 111 students noted that *practical experiments* contribute to critical thinking, analytical and research skills as well as ability to plan, organize and prioritize work. This form of learning activity has "...enabled the lecturers to identify the practical skills acquired by the students as well as their weaknesses in performing the experiments" [16]. The potentialities of on-line practical experiments are not confined to the assessment of practical skills. Test-takers may answer the questions, describe or explain their observations and demonstrate the awareness of the significance of the theoretical knowledge they had obtained at in-class instructor-led classes. Experience has shown, 61 of 111 students, that practical experiments successfully combined with project activities may be used to assess team working skills too.

On the other hand, the survey has revealed that the learners do not sometimes understand the educational goals of some e-assessment tasks. For example, 47 of 111 respondents mentioned that *multiple-choice* exercises improve team working skills, and 44 of them answered that *short answers* develop their ability to make decisions and solve problems. None of this is true but we cannot accuse the students only because the lectures' responsibility is to instruct and explain the tasks clearly. Over and above, the test-designer is required to inform the test-taker about the place, role and importance of the assignment in the whole system of professional knowledge.

Together these results provide important insights into the state of affairs in practice. Data analyzed for the purpose of this study indicate that both lecturers and learners are interested in on-line assessment activities. However, all relevant stakeholders obviously need methodical assistance in e-tests' designing and their completion. The results of the survey have become really meaningful to develop methodical recommendations for test-designers.

4 Findings

Moving on now to consider the practical ways of addressing the e-assessment issue. Dr I. Koneru supposes that the Learning Management Systems (LMS), such as Moodle (Modular Object-Oriented Dynamic Learning Environment) supports the integrated e-assessment systems. It provides formative (self-assessment, peer assessment, tutor-marked assignments), summative and competency-based assessment [10]. In our teaching practise, we use self-assessment through self-check exercises and in-text activities, continuous and tutor-marked evaluation through topical assignments and summative assessment through term-end tests on the Moodle platform. The Final tests [<http://mlib.knu.edu.ua/course/view.php?id=20334>] in English for specific purposes (ESP) for first-year students of Information Technology and Mechanical Engineering faculties have been developed taking advantage of Moodle quiz feature which enables to organize a time-bound activity and supports various questions types by KNU lecturers. The term-end tests consist of 100 different type questions namely, multiple-choice questions (MCQs), matching and short answers. It was identified that MCQs can be adopted more than just recall questions (lower cognitive levels of Bloom's taxonomy). Hence, Upasana Gitanjali Singh notes a dual role of MCQs – to obtain information on the different types of MCQs, as well as how applicable these types are to stimulating higher-order thinking skills (HOTS) in the students [17, p.138]. Test questions are shuffled so that each student will get a different assignment. This reduces to a minimum the potential for cheating at the test. Additionally, the students can see the correct answers as soon as the quiz is completed by all the respondents; this, in turn, prevents sharing the information with group mates. Students' answers are checked and recorded automatically that makes assessment error-free and delivers instant feedback. Automatic grading helps the learners accurately track their progress and creates a reliable e-assessment system. The quiz is divided into two parts: Grammar (60 questions) and ESP (40 questions). Grammar quiz is illustrated in Figure 3.



Fig.3. Word-formation assignment of grammar block

As noted previously, the final assessment is appropriate to ascertain the level of students' proficiency in a discipline. As a rule teachers use this kind of activity at the end of the course. Final assessment can be viewed as a formative assessment when the student uses it as a foundation for the work in successive courses, for example, a project in the first year can be a support to learning in the second year of study [17, p. 31]. Furthermore, the consistency of electronic marking removes concerns associated with subjective manual marking by the human assessor. The formative assessment (FA) can be the transitional phase between enrolment and final assessment phases. Its knowledge building role is undeniable. It is contributed to the sustainable improvement of language skills and facilitates to obtain the looked-for results in learning outcomes. One of the e-assessment benefits is that it might be viewed as a wake-up message for a lecturer in regard to if the students have adopted the material or not. In this context, the Moodle platform gives a wide range of instruments and tools, notably very comprehensive reports including time taken, number of attempts, date of start and completion, charts data with the overall number of students achieving grade ranges and so on (Figure 4).

Student Name	Status	Date	Score	Grade
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00
Finished	2020-11-10	2020-11-10	10	10.00

Fig.4. Charts data of students achieving grade ranges

The special ESP course “English for Mining Mechanical Engineers” (KNU) [http://mlib.knu.edu.ua/mod/quiz/report.php?id=13415&mode=overview] is targeted for the fourth- and fifth-year students of engineering majors based on Moodle platform. The on-line platform provides different grades reporting services for formative assessment, thus helping test-designers to collaborate with students and making work of both of them easier. The objective of the special course is to improve students' reading, listening, writing and speaking skills within the professional engineering context. Consequently in formative assessment what is really important for test-takers is to get quick feedback, and to be able to analyze the results and understand the mistakes.

The course “Competition law” (DLI) [<https://elearning.dli.donetsk.ua/course/view.php?id=116>] has been designed according to these principles as well. New material is represented as a lecture then the theory is supported by the thematic presentation and the third block consists of three types of assignments such as “Explore the problem...”, “Explain the phenomena...”, “Compare ...and give reasons for your choice”. The assessment is designed in the forms of discussion posts, case study and self-assessment (Figure 5).



Fig.5. Course “Competition law”. Topical Unit 1.

The theoretical block is followed by appropriate individual work and the in-depth study block. There are some options in this part of the Unit. At first, the students are offered to train their analytical and research skills and complete the tasks, for example: based on the current competition law, do some research on the impacts of the norms of economic competition on the relationships occurred outside the territory of Ukraine. The next task looks like a discussion post: determine the role of competition in entrepreneurial activity; justify your point of view. Finally, the students are proposed to organize themselves into groups (3-4 people in each one) and develop topical projects. There are three topics among which they can choose one, develop the project and represent it in class. In such a way they implement the theory into practice and train team working skills. All the assignments are collected in a folder that is how a student’s portfolio has been created. This midpoint assessment is primarily aimed at sending a message to the teacher: “OK. We are ready to continue!” or otherwise “Hang on a minute! We cannot keep up”. E-assessment significantly speeds up the feedback and facilitates fruitful interaction of the lecturer and the learners. All the question and assignment types discussed above can, in an e-assessment system, include high-resolution graphics, video, sound, animations and other multimedia elements which are used as part of the questions and not just as decorative images [11]. Figure 6 demonstrates the practical implementation of these principles in the course “English for cadets of the major “Law Enforcement Activities” [<https://elearning.dli.donetsk.ua/course/view.php?id=188>]. These questions can be adapted to test the higher cognitive levels of Bloom’s taxonomy [12].



Fig. 6. Combination of multiple choice questions and audio elements

The use of Moodle in the process of students professional training by means of computer modelling provides for the use of its tools to achieve the desired learning outcomes, and also the harmonious combination of traditional and distance learning, the formation on their basis of open information and educational environment (information and communication systems and traditional means aimed at organization of students educational activities) [19, p. 130].

Google provides a great number of tools to develop tests and tasks of e-assessment. For example, Google document gives an opportunity to choose the way of tests accomplishment individually. The learners are not limited by a rigid framework with fixed time or ways to fulfil. Figure 7 displays a vocabulary test. The purpose of the test is to provide diagnostic feedback to the learners, as well as to inform the lecturer about the necessity to tailor the course more closely to the needs of this group of students [4]. The test-takers are given specific sets of words to be filled in the right context of the given sentences. The specific of the test is that the words are synonymous and can be used more than once.



Fig. 7. Vocabulary test on Google Class platform

As we can see in the figure the learner's approach to the test completion is creative enough. Different colours are associated with each of the words. It does not create additional pressure and can be an additional motivation to improve English grammar and vocabulary.

Google Class platform provides the test-designers with a wide range of e-assessment instruments, which enable to systematize, analyze and follow the whole group progress as well as an individual student' results. Figure 8 illustrates the portfolio of KNU academic group.

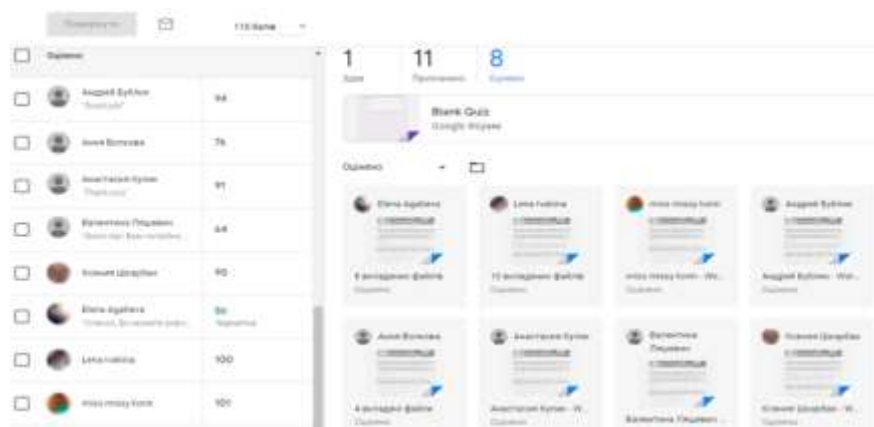


Fig.8. Portfolio of the academic group on Google Class platform

Analysis of the practical experience of Kryvyi Rih National University and Donetsk Law Institute of the Ministry of Internal Affairs of Ukraine demonstrates convincingly that an extensive choice of e-assessment tools contributes to the practical implementation of individual approach, allows correcting the content of the courses and tailors them according to students' needs. For another thing, the e-assessment toolset confers the possibility to instruct each of the test-takers individually, to inform them about the test results in confidence not to hurt their pride. In addition, we cannot fail to mention that e-assessment approach facilitates implementing of interactive learning strategies. In fact, as we have said, this approach switches the role of a teacher from a manager to a facilitator; it encourages learners to be involved; it is expected students to participate in learning/assessment process. Implementation of e-assessment provides practical experience of using information and communications technologies for both test-designers and test-takers.

5 Conclusions and prospects for further research

Theoretical study of recent scientific researches in regard to the e-assessment issue has consolidated our hypothesis that despite the labour and time-consuming of this approach, it is advanced, highly developed and upgraded constituent of e-learning targeted at measuring learner's progress, which provides substantial benefits for both

stakeholders. The conducted survey has revealed the advantages of on-line testing activities taking into consideration the test-takers' point of view, they are student's friendly environment, fast and easily accessible feedback, an opportunity to keep privacy and work individually, at the same time there is a good chance to improve team working skills depending on the activity. However, the students note such disadvantages of e-assessment as lack of accuracy because of learning by rote/guessing the answers of most commonly used forms of e-tests, namely multiple choice and short answers; one more problem they have to cope with is that it is impossible to assess oral speaking or writing skills using some forms and activities. The purpose of the current study is to develop methodological recommendations for organizing and effective implementation of e-assessment in higher education based on the practice of Kryvyi Rih National University and Donetsk Law Institute of the Ministry of Internal Affairs of Ukraine. Review the current usage and feasibility for various e-assessment tools enables to conclude that e-assessment has already become a congruous component of prospective specialists' training; university teachers entrench e-assessment in view of individual approach to studying and meeting individual student's needs; the test-designers successfully deal with different levels of testing complexity according to Bloom's taxonomy. Notwithstanding any advantages contained herein, these revealed a number of problems; in particular, the test-designers require support in developing the criteria for assessing student's proficiency; lectures may find it difficult to develop reliable assessment instruments to evaluate particular skill; the teachers also experienced difficulty with formulating the instructions clearly. By and large, the study is targeted to cope with mentioned challenges.

Taking into account theoretical and practical experience we have developed the methodical recommendations for e-test-designing. The research has shown that the test designers should follow the algorithm which includes several steps to succeed. They are:

- to determine *who the test-takers are*; the purpose of the test is a starting point for any assessment activity;
- to define the skill/skills are to be tested and assessed; it would be a marked advantage if e-test includes a short description of the ability is the test aimed at in the context of the discipline;
- to choose appropriate tools for developing e-assessment tests and tasks (Moodle, Google or any other);
- to develop clear criteria for assessment, specific characteristic and settings such as time constraints, scoring method, and e-platform to display the test;
- to specify forms of feedback; it might be represented as data results, a graph, a piece of advice, comment, response, opinion, survey rating; The feedback must be a meaningful tool for test-designer because it is the only way to evaluate and encourage the learner;
- e-assessment should focus on things that matter and things that can be controlled; in other words, it should be representative for the domain;
- to provide necessary knowledge and e-tools for test-takers to operate the test and its feedback;
- to give clear and effective instructions;

- to determine what the expected outcome is.

Consequently, the teachers are provided with ample opportunities to develop concepts and e-tools in relation to e-assessment. The lecture should take full advantage of e-assessment to meet individual student's needs, for example, he can complete the e-test at his own pace, to have several attempts to complete the task, to get immediate feedback and analyze the mistakes, to discuss the results with the other test-takers and the test-designer etc. E-assessment provides privacy, fairness and objectiveness of results, everyone is in equal condition, no one can impact the results. In addition, this way to assess the students' knowledge excludes cheating at the test, to a great extent.

The study suggests that different forms of e-assessment have a positive impact on the training of prospective specialists in different industries. Successful online interaction allows students to demonstrate not just content mastery but the ability to incorporate theoretical content into practice, which is particularly valuable to beginning practitioners.

A further study could assess the long-term effects of e-assessment forms on learning outcomes on different subjects and developing appropriate criteria of e-assessment activities as well.

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