opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía, Lingüística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 36, 2020, Especial N° 27

Revista de Ciencias Humanas y Sociales
ISSN 1012-1587/ ISSNe: 2477-9385
Depósito Legal pp 198402ZU45

Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Opción, Año 36, Especial No.27(2020): 240-260
ISSN 1012-1587/ISSNe: 2477-9385

New assessment technologies to evaluate current and intermediate knowledge of learners

Irina F. Semenycheva[1]
[1]I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation
Semenycheva_i_f@staff.sechenov.ru

Valentina V. Latysheva[2]
[2]Moscow Aviation Institute (National Research University), Moscow, Russian Federation
latyshevaWW@mai.ru

Tatyana N. Sakulyeva[3]
[3]State University of Management, Moscow, Russian Federation
tn_sakulyeva@guu.ru

Larisa V. Semenova[4]
[4]Bashkir State Medical University of the Ministry of Health of the Russian Federation, Ufa, Russian Federation
larokan@bashgmu.ru

Yuliya A. Tikhonova[5]
[5] I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation
Kafedra-oef2012@mma.ru

Abstract

Modern education development trends, and the emergence of new modes of study put forward new requirements for testing. The purpose of the research is to scientifically substantiate the application of testing technologies aimed at increasing student motivation to acquire economic competencies. In order to experimentally verify the feasibility of testing technologies as a factor that increases the motivation and success of learners of non-economic specialties, a pedagogical experiment was conducted. It has been established that the maximum effect is achieved through the integrated approach - the use

Recibido: 20-12-2019 •Aceptado: 20-02-2020

of testing technologies to assess both current and intermediate (final) knowledge of learners.

Keywords: Test, Control system, Economic competencies, Self-control, University.

Nuevas tecnologías de evaluación para evaluar los conocimientos actuales e intermedios de los alumnos

Resumen

Las tendencias modernas de desarrollo educativo, y la aparición de nuevos modos de estudio plantean nuevos requisitos para las pruebas. El propósito de la investigación es fundamentar científicamente la aplicación de tecnologías de prueba destinadas an aumentar la motivación de los estudiantes para adquirir competencias económicas. Con el fin de verificar experimentalmente la viabilidad de las tecnologías de prueba como un factor que aumenta la motivación y el éxito de los estudiantes de especialidades no económicas, se realizó un experimento pedagógico. Se ha establecido que el efecto máximo se logra a través Del enfoque integrado: el uso de tecnologías de prueba para evaluar el conocimiento actual e intermedio (final) de los alumnos.

Palabras clave: Test, Sistema de control, Competencias económicas, Autocontrol, Universidad.

1. INTRODUCTION

According to the modern labor market requirements, the professional competencies of a potential employee are assessed based on their soft-skills, motivation, and compliance with modern requirements rather than knowledge. Lifelong learning is a popular current trend. At the same time, new modes of study (e-learning, m-learning, d-learning) appear. Moreover, the functional value and

attractiveness of the traditional education model are decreasing. At the same time, the approach based on the development of competencies, project thinking, analytical abilities, a motivated desire for continuous self-education, self-improvement, and the ability to independently design educational and future professional activities ensuring the success of personal and professional growth is becoming popular. More and more people consider it necessary to receive additional education.

These trends are reflected through increased volume of information and higher requirements for the speed and objectivity of its processing and analysis, as well as for the management and accumulation of statistical educational information, which traditional forms of control do not correspond to. The introduction of pedagogical testing as a means of control in the educational practice of universities makes it possible to shift the emphasis from organizational and internal control (teacher control) to learners' self-control, as well as to determine statistical norms and criteria for achieving the quality of higher education, including by collecting objective educational information.

Today, the most effective and optimal method of knowledge assessment is based on the principles of testing. Testing makes it possible to carry out self-control of learners and provide feedback in the context of individual topics, as well as the whole course. The use of pedagogical testing as a means of monitoring the educational process contributes to the activation of educational and cognitive

activities and professional self-improvement. Nowadays, there is no other knowledge assessment tool for the quantitative measurement of hidden pedagogical parameters, such as the complexity of a task. In this case, the knowledge of each student is determined and qualitatively evaluated. This approach allows teachers to get feedback on the quality of their work and to adjust the educational process. In the education system, the emphasis shifts from monitoring and evaluating knowledge in the subject to readiness and ability to apply it.

Testing makes it possible to determine and compare knowledge in different disciplines, as well as to measure general proficiency.

Knowledge assessment testing requires a change in the approach to curriculum development, discipline content, the use of modern information technologies and means of communication, which corresponds to modern global trends affecting the role of the diagnostic system in higher education. At the present stage of social development, assessment and learning are interconnected and interpenetrating components of a single educational process.

In modern pedagogy, testing is a form of knowledge assessment that is widely used primarily in developed countries, where a significant amount of retrospective research on the effectiveness and appropriateness of testing has been conducted (VINOVSKIS, 2019). Over more than 150 years of pedagogical testing history, it has been established that the use of tests improves the general quality of education. This creates the prerequisites for improving the quality of

life of the population. At the same time, some researchers support traditional pen and paper examinations to assess the knowledge of learners (CARLESS, 2015).

Testing as a way of assessing knowledge provides a lot of advantages (OECD, 2018; PELLEGRINO AND QUELLMALZ, 2010):

- testing provides objective knowledge assessment;

- ensures equal assessment conditions;

- excludes subjectivity;

- rationalizes time and efforts when using test tasks;

- provides the ability to quickly and objectively process the results;

- allows using the results to manage the learning process.

The disadvantages of testing include (OECD, 2018; PELLEGRINO AND QUELLMALZ, 2010):

- testing does not allow receiving a detailed answer;

- testing makes it impossible to test skills; it is focused only on knowledge;

- It does not exclude the possibility of guessing the correct answer;

- Competent development of tests requires highly qualified developers;

- Case-studies, which are an important way of learning, cannot be tested.

The purpose of testing is to obtain a current and intermediate (final) assessment, as well as self-assessment of learners in the learning process (NORTON et al., 2013). Self-assessment allows learners to improve performance by feedback from test results (ĆUKUŠIĆ et al., 2014; SAMBELL et al., 2013). At the same time, the implementation of computer testing makes it possible to better prepare for subsequent testing. Researchers also note that more frequent use of tests as an assessment method contributes to the overall performance of learners (BERNATZKY et al., 2017).

The importance of testing economic knowledge is confirmed by the fact that in the USA the assessment of the economic knowledge of school graduates is mandatory and is carried out using several standardized tests: Basic Economics Test (BET), Test of Economic Knowledge (TEK), Test of Understanding in College Economics

(TUCE), The Test of Economic Literacy (TEL) (WALSTAD et al., 2013).

Although college and university enrollment in the United States is based on various tests, their role varies widely across educational institutions. Despite the fact that test results are constantly indicated as one of the most important university admission factors, an increasing number of institutions apply the policy of "optional testing" and partially trust the results of national tests (ZWICK, 2019).

The researchers note that American students often demonstrate very different and poor economic test results at universities (NATIONAL RESEARCH COUNCIL, 2012) while significantly improving their performance in response to various motivational incentives (GNEEZY ET al., 2019). Similar conclusions were made by German scientists who note that students demonstrate very different initial knowledge in economic disciplines, which affects their final test results (HAPP et al., 2016). The difference in the initial knowledge of learners complicates the development of the course outline and affects the results of learners after completing the course (HAPP et al., 2016).

The complexity of developing economic courses is one of the factors that complicate the development of tests for assessing learners' knowledge in economic disciplines. As a rule, multiple-choice tests (MCQ) are used to assess knowledge. However, it was found that the results of such tests do not always fully measure student achievements

compared to other methods. This puts forward high requirements for adequate test development (BROWN AND ABDULNABI, 2017).

This may be one of the reasons why some researchers consider testing as a factor that negatively affects the learning process (ERTMER AND NEWBY, 2013). In turn, this can be explained by the low awareness of university teachers of all testing implementation methods (WEBBER, 2012). Despite this, university teachers believe that testing is the most appropriate way to assess learners' knowledge, although there are differences between the results obtained in the traditional assessment and testing, which are explained by the inaccuracy of each of the assessment methods (PEREIRA AND FLORES, 2016).

Modern education is characterized by the emergence of new modes of study (e-learning, m-learning, d-learning) (KUMAR BASAK et al., 2018). This contributes to the development of mobile and remote versions of various disciplines. Thus, various information systems are used to achieve that. They include, for example, the World Wide Web Course Tools distance learning system developed at the University of Vancouver, Canada. Courses developed on the basis of the MOODLE platform (DOUGIAMAS AND TAYLOR, 2003), which allows learners to work individually and pass tests to assess themselves, have become more widespread in domestic universities. The mandatory system elements are “Self-check”, “Tests” and “Tasks”. They make it possible to provide feedback between the teacher and the student in the process of control and evaluation activities.

Testing technologies are also acquiring importance due to the increased desire of the population for self-education, which is reflected in the development and implementation of different e-courses at various universities. Thus, in modern pedagogy, testing is the main means of assessing knowledge; both the teacher and the student benefit from it.

In recent years, in our country, there have been significant changes in the introduction of testing technologies in the educational process of universities. In the context of economic knowledge assessment, this problem has special significance due to the specificity of most economic disciplines, which is the need to develop creative and abstract thinking, willingness to experiment, and readiness to seek new solutions to a particular problem in order to draw various kinds of analytical and economic conclusions. Therefore, knowledge assessment also requires the solution of various situational tasks, the development and presentation of analytical plans, programs, innovative projects, and their components. The traditional approach to test development, setting bounds to the disclosure of creative potential when solving problems, is not typically used in economic disciplines.

In this regard, tests in Economics should be considered as an integral part of the knowledge assessment system of learners studying Economics and other disciplines. The hypothesis of the study is based on the fact that the use of tests when teaching learners of non-economic specialties will contribute to the development of their economic competencies.

The purpose of the research is to scientifically substantiate the application of testing technologies aimed at increasing student motivation to acquire economic competencies.

The following research tasks have been defined, namely:

- To analyze the organization of the current and intermediate (final) knowledge assessment by determining the attitude of teachers and learners to the existing practice;

- To study and characterize the pedagogical foundations of quality assessment of learners' knowledge in economic disciplines;

- To develop practical recommendations for learners and teachers on the design and use of pedagogical tests in order to optimize self-assessment.

2. METHODOLOGY

In order to experimentally verify the feasibility of testing technologies as a factor that increases the motivation and success of learners of non-economic specialties, a pedagogical experiment was conducted. Four groups of third-year students from four universities took part in the study: First Moscow State Medical University (Group 1); Bashkir State Medical University (Group 2); St. Petersburg State University (Group 3); Far Eastern Federal University (Group 4). The analysis results are presented in Table 1. The dynamics of the grade

point average in "Economics and Management" disciplines (Enterprise Economics, Health Economics) was evaluated.

Table 1: The quantitative composition of the experimental groups

Indicator	Group 1	Group 2	Group 3	Group 4
Number of learners	24	22	28	26
Female	12	11	15	12
Male	12	11	13	14

Indicator

There were two stages of the experiment: diagnostic-ascertaining and control.

The purpose of the first stage was to analyze the organization of the current and intermediate (final) knowledge assessment by determining the attitude of teachers and learners to the existing practice. The assessment procedure was monitored; the learners and teachers were questioned; the awareness of the problem and the degree of the use of this technology in the practice of teaching economic disciplines were clarified. Based on the results of the diagnostic-ascertaining experiment, we developed a program aimed at the introduction of a pedagogical testing technology into the educational process in order to optimize assessment procedures.

Experiment conditions:

- Group 1 used traditional forms of current and intermediate (final) knowledge assessment: tests and a written exam;

- Group 2 used traditional written tests and test examinations;

- Group 3 used current knowledge assessment tests and a written exam;

- Group 4 used current and intermediate (final) knowledge assessment tests.

In all cases, test assessment was considered as a component of the educational process. The algorithm for organizing test assessment in economic disciplines provided for the following:

1) Conducting contact classes or advising on the material submitted for self-study;

2) Teacher's explanation of the test tasks, familiarization of learners with test examples, the solution of organizational issues;

3) The explanation of the operation of the computer assessment system (in the case of its use);

4) The fulfillment of test tasks by learners;

5) Test check by the teacher;

6) The assessment of educational and cognitive activity of learners;

7) Generalization of test results and correction of mistakes.

The final test covered all topics of the discipline and included multiple- and single-choice questions.

The purpose of the control experiment was to conduct a comparative analysis of the data obtained under the conditions of traditional learning in the control group and learning based on pedagogical testing in the experimental groups. During the experiment (before and after the course), the attitude of learners to entrepreneurial activities was determined.

3. RESULTS AND DISCUSSION

The analysis of the data obtained, as well as the observation data revealed the following shortcomings in the organization of knowledge assessment:

- 80% of respondents recognize the importance of self-control, but 67% of learners ignore it;

- Control is mainly of organizational and internal nature, that is, it is carried out by the teacher;

- Most teachers (75.6%) ignore the developing potential of self-control;

- The vast majority of teachers (87.0%) perceive control conservatively and consider it ascertaining;

- The educational, upbringing and developing potential of control is realized by 18.0% of teachers;

- Most teachers (86.6%) do not make adjustments to the process of teaching the subject according to the knowledge assessment results;

- Most teachers (75.6%) do not direct learners' attention to the importance of control and self-control;

- The prevailing forms of control are oral recitation and written tasks; they are used by 100% of teachers;

- Current knowledge assessment tests are used by 54% of teachers;

- The majority of teachers (81.0%) recognize the need to use more advanced forms of knowledge assessment;

- testing is considered the most promising form of knowledge assessment by 92.0% of teachers and 84% of learners.

The importance of the learners' attitude to entrepreneurial activities and motivation to study economic disciplines is explained by

the fact that according to the survey, 84% of learners used to consider Economics and Management disciplines optional for their future professional activities and would prefer not to waste time studying them. Table 2 presents the dynamics of the grade point average in "Enterprise Economics" and "Health Economics" after the course completion by the 4 groups.

Table 2: The value of the grade point average in "Enterprise Economics" and "Health Economics" of learners of the experimental groups (N=100) after the experiment

Groups of learners	Group 1 (N=24)	Group 2 (N=22)	Group 3 (N=28)	Group 4 (N=26)
Grade point average (on a 100-point scale)	65.2	70.2	74.2	81.2

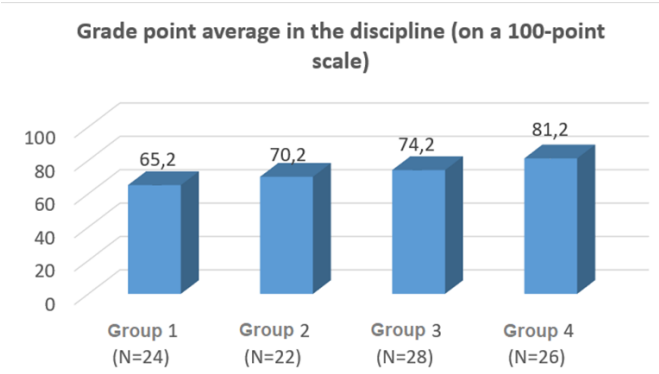

Figure 1: The value of the grade point average in "Enterprise Economics" and "Health Economics" of learners of the experimental groups (N=100) after the experiment

Table 3: The distribution of learners (N = 100) by the mastery of "Enterprise Economics" and "Health Economics"

Mastery levels	Group 1 (N=24)	Group 2 (N=22)	Group 3 (N=28)	Group 4 (N=26)
Low (up to 60 points)	5	8	-	-
Satisfactory (61-70 points)	12	12	3	5
Sufficient (71-82%)	7	8	9	9
High (83-100 points)	-	-	10	12

It can be concluded that the maximum effect is achieved through the integrated approach - the use of testing technologies to assess both current and intermediate (final) knowledge of learners. The attitude of learners to entrepreneurial activities was also evaluated in the course of the experiment:

- After the course completion, the majority of learners (87%) demonstrated an understanding of the importance of studying “Economics and Management” disciplines for the development of their professional competencies;

- An understanding of economic processes and the essence of market relations was demonstrated by 56.0% of learners;

- The level of knowledge in the discipline depended on the applied knowledge assessment forms (Table 2);

- The number of learners positively considering the likelihood of entrepreneurial activity significantly increased;

- learners devote more attention and time to preparing for testing rather than for traditional forms of knowledge assessment; testing covers the topic being studied more comprehensively;

- The majority of learners (73%) consider being involved in entrepreneurial activities; 68.2% of learners showed a positive attitude to entrepreneurship before they started studying economic disciplines; after the course completion, their number was 91.8%.

4. CONCLUSION

Testing is becoming the main form of control in modern universities as it implements all the assessment requirements. At the same time, testing is becoming the main form of current and intermediate (final) knowledge assessment in full-time learning. However, this is not the only tool as it is aimed at controlling the knowledge rather than the skills necessary for the formation of relevant competencies: abstract thinking skills, willingness to experiment, and readiness to seek new solutions to a particular problem in order to draw various kinds of analytical and economic

conclusions. The test is considered as an integral part of the knowledge assessment system.

In the study, we have verified the feasibility of testing technologies as a factor that increases the motivation and success of learners of non-economic specialties. A pedagogical experiment was conducted in four Russian universities. The experiment involved four groups of third-year learners. The dynamics of the grade point average in "Economics and Management" disciplines was evaluated. Group 1 used traditional forms of current and intermediate (final) knowledge assessment; Group 2 used traditional written tests and test examinations; Group 3 used current knowledge assessment tests and a written exam; Group 4 used current and intermediate (final) knowledge assessment tests.

It was found that control is mainly of organizational and internal nature, that is, it is carried out by the teacher; the development potential of student self-control is rarely used. It was also revealed that self-control and self-assessment are not the subject of special competency formation in the educational process. The results of the study demonstrated the uniformity of control means and methods. It was established that the maximum grade point average in the subject was observed in the case of the integrated use of testing: current and intermediate (final) along with the use of other forms of control (solving various kinds of situational problems, developing and presenting analytical plans, programs, innovative projects and their components).

The role of the personality factor in the development of educational material, namely, in increasing personal motivation to develop educational achievements, is shown. The use of tests in the learning process increases the motivation of learners to engage in future entrepreneurial activities in various industries. At the same time, significant changes in the hierarchy of student motives have been noted: social, socially significant and creative motives have become dominant. The use of pedagogical testing as a means of monitoring the educational process contributes to the activation of educational and cognitive activities and professional self-improvement.

REFERENCES

BERNATZKY, M., CABRERA, J. M., & CID, A. 2017. "Frequency of testing. Lessons from a field experiment in higher education". **Journal of Economics and Economic Education Research**, 19(1), 1-11.

BROWN, G. T., & ABDULNABI, H. H. 2017. "Evaluating the Quality of higher education instructor-constructed Multiple-choice Tests: impact on student grades". **In Frontiers in Education** (Vol. 2, p. 24). Frontiers.

CARLESS, D. 2015. **Excellence in university assessment: Learning from award-winning practice.** Routledge.

ĆUKUŠIĆ, M., GARAČA, Ž, & JADRIĆ, M. 2014. "Online self-assessment and students' success in higher education institutions". **Computers & Education**, 72, 100-109.

DOUGIAMAS, M., & TAYLOR, P. 2003. **Moodle: Using learning communities to create an open source course management system.** In EdMedia+ Innovate Learning (pp. 171-178). Association for the Advancement of Computing in Education (AACE).

ERTMER, P. A., & NEWBY, T. J. 2013. "Behaviorism, cognitivism, and constructivism: Comparing critical features from an instructional design perspective". **Performance improvement quarterly**, 26(2), 43-71.

GNEEZY, U., LIST, J. A., LIVINGSTON, J. A., QIN, X., SADOFF, S., & XU, Y. 2019. "Measuring success in education: the role of effort on the test itself". **American Economic Review: Insights**, 1(3), 291-308.

HAPP, R., FÖRSTER, M., ZLATKIN-TROITSCHANSKAIA, O., & CARSTENSEN, V. 2016. "Assessing the previous economic knowledge of beginning students in Germany: Implications for teaching economics in basic courses". **Citizenship, Social and Economic Education**, 15(1), 45-57.

KUMAR BASAK, S., WOTTO, M., & BÉLANGER, P. 2018. "E-learning, M-learning and D-learning: Conceptual definition and comparative analysis". **E-Learning and Digital Media**, 15(4), 191-216.

NATIONAL RESEARCH COUNCIL. 2012. **Improving Measurement of Productivity in Higher Education.** Washington, DC: The National Academies Press.

NORTON, L., NORTON, B., & SHANNON, L. 2013. **Revitalising assessment design: what is holding new lecturers back?** Higher Education, 66(2), 233-251.

OECD 2018. **Equity in Education: Breaking Down Barriers to Social Mobility.** PISA: OECD Publishing, Paris.

PELLEGRINO, J. W., & QUELLMALZ, E. S. 2010. "Perspectives on the integration of technology and assessment". **Journal of Research on Technology in Education**, 43(2), 119-134.

PEREIRA, D. R., & FLORES, M. A. 2016. "Conceptions and practices of assessment in higher education: A study of Portuguese university teachers". **Revista Iberoamericana de Evaluación Educativa**, 9(1), 9-29.

SAMBELL, K., MCDOWELL, L., & MONTGOMERY, C. 2013. **Assessment for learning in higher education.** Routledge.

SEEBER, S. 2016. "Economic competencies and situation-specific commercial competencies: Reflections on conceptualization and measurement". **Citizenship, Social and Economic Education**, 15(3), 162-182.

SERDYUKOV, P. 2017. "Innovation in education: what works, what doesn't, and what to do about it?" **Journal of Research in Innovative Teaching & Learning,** 10, 4-33.

VINOVSKIS, M. A. 2019. **History of testing in the United States: PK–12 education.** The ANNALS of the American Academy of Political and Social Science, 683(1), 22-37.

WALSTAD, W. B., REBECK, K., & BUTTERS, R. B. 2013. "The test of economic literacy: Development and results". **The Journal of Economic Education**, 44(3), 298-309.

WEBBER, K. L. 2012. **The use of learner-centered assessment in US colleges and universities.** Research in Higher Education, 53(2), 201-228.

ZWICK, R. 2019. "Assessment in American Higher Education: The Role of Admissions Tests". **The ANNALS of the American Academy of Political and Social Science**, 683(1), 130-148.

UNIVERSIDAD DEL ZULIA

opción
Revista de Ciencias Humanas y Sociales

Año 36, Especial N° 27 (2020)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.
Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve