

Analysis: The State of the Art Surveys. – New York: Springer Science+Business Media, Inc., 2005. – P. 133–162.

3. Corrente S., Greco S., Slowinski R. Multiple criteria hierarchy process with ELECTRE and PROMETHEE // Omega. – 2013. – Vol. 41, Issue 5. – P. 820–846.

4. Bilbao-Terol A., Arenas-Parra M., Canal-Fernandez V., Antomil-Ibias J. Using TOPSIS for assessing the sustainability of government bond funds // Omega. – 2014. – P. 1–17.

5. Petrov K.E, Kryuchkovsky V.V. Comparative structural-parametric identification of models of scalar multivariate estimation. – Kherson: Oldi-plus, 2009. – 294 p.

6. Ovezgel'dyev A.O., Petrov K.E. Modeling individual multifactor estimation using GMDH elements and genetic algorithms // Cybernetics and Systems Analysis. – 2007. – No.43. P. 126–133.

7. Breiman L. Bagging predictors // Machine Learning. – 1996. – Vol. 24, Issue 2. – P. 123–140.

**Babko Natalia, PhD in Economics, Associate Professor**  
**Kuskova Svitlana, PhD in Economics, Associate Professor**  
**Orel Volodymyr, Doctor of Economic Sciences, Professor**  
Kharkiv Petro Vasylenko National Technical University of  
Agriculture

## **THE ROLE OF STUDENTS 'INDEPENDENT WORK IN THE PROCESS OF FORMING THE BACHELOR'S PROFESSIONAL COMPETENCIES IN MARKETING**

The gradual integration of the national education system into the European and the world requires new approaches in the training of qualified specialists, which will be based on increasing the organizational, didactic and methodological resources of independent work. The process of reforming and developing the system of higher vocational education at the present stage is characterized by increased emphasis on enhancing the role of independent work of the subjects of the educational process, which is confirmed by the fundamental principles and requirements of the Bologna Process.

According to the Regulation of the Ministry of Education and Science of Ukraine on the organization of the educational process in higher education institutions for the organization of independent work

of students is provided up to 2/3 of the total volume of the educational process. The transition to this form of organization of educational activity is caused, first of all, by the lag of the development of educational processes and technologies of learning from the rate of development of scientific and technological progress. Much of the professional knowledge that a future specialist must acquire is updated annually. The modern labor market needs initiative, purposeful and creative specialists who have a high level of theoretical and practical training, are able to make their own decisions and are a source of development and progress of the field of science or production in which they are involved.

It is understandable that in order to reach the appropriate professional level, it is necessary to prepare future marketing specialists for independent work. It is very important that during the organization of the process of preparation of the specialist in the personality the desire for self-development, self-improvement, self-realization was developed. The implementation of such strategies largely depends on the effectiveness of students' independent work, which encourages pedagogical science to search for new models, technologies of rational organization, as well as the right approach (encouragement) of each teacher. But with the encouragement, it is necessary to take into account the individual characteristics of each student and create rational conditions for self-education.

The real activation of students' independent work is characterized not by the search at all, but by the search for ways of solving problems, not only the assimilation of the results of scientific cognition, the system of knowledge, but also the very path of the process of obtaining these results, the formation of students' cognitive independent activity, the development of their creative abilities.

Independent work of students performs a number of important functions:

1. Educational - consists in the development of primary sources. Contributes to a deeper understanding of already learned knowledge.
2. Cognitive - is to acquire new knowledge, expand the boundaries of worldview.
3. Corrective - involves understanding the latest theories, concepts, categories, approaches to determining the essence of known concepts, directions of science.
4. Incentive - such an organization of independent work, when the student gets pleasure from the results of cognitive activity.

5. Educational - aimed at the formation of such qualities of the personality as the will, commitment, responsibility, discipline.

6. Developmental - aimed at the development of independence, creativity, research skills of the individual.

In our opinion, the program of actions for organizing students' independent work in order to form the professional competencies of the Bachelor of Marketing should consist of the following stages:

1) studying the conditions of formation of students' ability to perform tasks independently;

2) analysis of the curriculum and curriculum;

3) determine the content and scope of independent work;

4) preparation of the list of knowledge and skills that a student should acquire in the process of independent work;

5) diagnosing the individual characteristics of students and determining the content and means of independent work for each of them;

6) formation of a bank of professionally oriented tasks for independent work (for independent study of theory, testing of practical skills acquired during independent work, self-control of knowledge and skills, etc.) and grouping of these tasks into blocks;

7) determination of methods of control of independent work and criteria of evaluation of task performance;

8) development of a system of stimulating students' independent work, taking into account the level of their academic achievements and individual characteristics.

We believe that in order to ensure the formation of professional competences in the process of independent work of students, on the one hand, the work of a student with educational literature, which is performed outside the main schedule of classes, and on the other hand, - constant, purposeful work performed by the student in the course of scheduled classes, where he listens and self-explanatory explanations of the teacher, in practical classes, alone or in a team performs tasks, solves problems, etc.

The selection and structuring of content for independent (individual) work is based on the following principles:

- modularity (as meaningful completeness of a part of a discipline);

- systematic;

- interdisciplinarity and integration;

- individualization and differentiation;

- creativity for students to develop skills to solve practical problems at the reproductive, adaptive, partially searching and creative levels of complexity;

- Compensation (expansion of knowledge due to the orientation of students to self-search and systematization of additional information, increase of acquired professionally important knowledge in order to ensure completeness of their actualization),

- multilevel, which provides for the gradual complication of the content of research activities by reducing or multiplying the tasks of research, narrowing or expanding the scope of research tasks. The principle of multilevel allows to fully take into account the individual abilities of students, the level of their actual mental development, the degree of mastery of educational material.

We believe that in order to organize effective independent work of students, they must have some basic knowledge of: methodology of scientific research; scientific organization of student's work; features of the organization of independent (individual) work on credit-modular technology of training; the features of the module rating system; methods of scientific research; modern forms of self-education, technologies of self-study; basic principles of the concept of lifelong learning; technologies of project work.

Therefore, in order to organize effective independent work of students of bachelor's degree of higher education in the specialty "marketing" certain basic skills and skills are required:

1) Intellectual:

- use the conceptual apparatus of scientific research;
- to highlight the main, minor in the information (scientific) texts;

- consciously use logical methods of thinking (analogy, comparison, analysis, synthesis);

- interpret the results of their own intellectual activity, draw conclusions, generalizations;

- work with information (classify, summarize, interpret);

2) Search, research:

- independently find the necessary information in the information field;

- Establish cause and effect relationships

- use scientific methods of cognition: modeling, experiment, observation, work with primary sources, etc .;

- identify the main components of scientific research, draw up a program of scientific research;

- adequately evaluate their own activities;

3) Information:

- use information and communication technologies to obtain necessary information, classification, systematization and its design;

- to use technologies of constant updating of knowledge, improvement of skills;

- to develop own strategies, models of self-education;

- organize the process of self-study;

- determine the feasibility of their own educational trajectories;

- to choose their own methods of training;

- carry out projects;

- use new technologies and communications;

- quickly adapt to new conditions of work or study, find new solutions, overcome difficulties.

In our opinion, the most effective types of independent work for the formation of professional competencies of future bachelors in marketing are the following:

1. Read relevant sections in textbooks and manuals, professionally oriented reading of methodical articles.

2. Making a list of articles on a particular topic and annotating them.

3. Review of methodical articles.

4. Defining the goals, objectives and content of a particular topic (section) of the discipline.

5. Preparation by students of short messages methodical in nature.

6. Preparation of abstracts, reports with their subsequent discussion.

7. Writing coursework.

8. Performance of individual educational research tasks.

Thus, the independent work of students should ensure the systematic knowledge and learning tools, mobility and critical thinking, possession of information processing tools, the ability to creative work.

### **List of references**

1. Kovalchuk G.O. Reinforcing learning in economic education: Educ. manual K. : KNEU. 2003. - 298 p.

2. Kryzhanivska VP The requirements of modern society for economic personnel and the purpose of their professional training. Modern information technologies and innovative teaching methods in the training of specialists: methodology, theory, experience, problems:

Coll. of sciences. - Issue 19. Kyiv-Vinnytsia: Vinnytsia State  
Enterprise, 2008. - P. 237 - 243.

**Grechanyk Vera Grigorivna, Associated Professor**  
Kyiv National University Construction and Architecture  
**ChornovolVictoriyaOleksandrivna, Ph.D., Associate  
Professor**  
Kyiv National University Construction and Architecture  
**LavrykRuslan Volodimirovich, Ph.D., Associate Professor**  
National University of life and Environmental Sciences of  
Ukraine

### **STUDY OF IMPACT OF CO<sub>2</sub> AND SO<sub>2</sub> IMPOSSIBLE IMPROVEMENTS ON CORROSION OF COMPOSITION MATERIALS ON BASE OF COPPER**

The problem of the industrial scale of all developed countries of the world is the destruction of metals and their alloys under the influence of the environment. Atmospheric corrosion causes great damage to structures operated outdoors. The degree of aggressiveness of the influence of the environment on the compositions in atmospheric corrosion depends on their composition, type, concentration of harmful impurities and gases present in the air, humidity and duration of stay in the environment.

Since copper and molybdenum (Cu-Zr-Y)-Mo composite materials are widely used as electrocontact materials of various purposes [1-4], working in atmospheric conditions contaminated with harmful emissions, it became necessary to investigate their corrosion resistance in conditions that mimic the environment. Annually, the amount of SO<sub>2</sub> released into the atmosphere from the combustion of fuel is 8% (wt.), which is about 90 million tonnes of this harmful gas in the air space. With increasing humidity, corrosion processes are greatly accelerated. In this regard, the study used distilled water, which corresponds to 100% humidity, saturated SO<sub>2</sub> and CO<sub>2</sub> at pH = 6.7. Composite materials (CM) (Cu-Zr-Y) -Mo were obtained by electron-beam evaporation of Cu and Mo from two independent crucibles, followed by condensation in a vacuum of mixed steam flow on a stationary substrate with a diameter of 800 mm, made from C 3 at 800 ± 3000C [5].