with solar energy resources throughout the year is an effective approach. However, it is essential to rely on fuel-based resources only when necessary, ensuring a sustainable and efficient energy supply.

During the simulation of the solar module, it underwent testing under various load and solar radiation conditions. This testing revealed a strong correlation between the manufacturer-provided specifications of the solar module and the characteristics observed when simulated in the Matlab/Simulink environment. The deviation between the simulation results and the passport characteristics remained within acceptable limits. When the inverter was connected to the solar module, it generated the required output voltage for operating electrical equipment. This successful connection confirms the reliability and accuracy of the proposed simulation model.

## References


1. On the approval of the Strategy for Environmental Safety and Adaptation to Climate Change for the period up to 2030: Order. Kab. of the Ministers of Ukraine dated October 20, 2021 No. 1363 URL: https://zakon.rada.gov.ua/laws/show/1363-2021-p#Text.
2. Christian Bussar, Melchior Moos, Ricardo Alvarez, Philipp Wolf et al, Optimal allocation and capacity of energy storage systems in a future European power system with 100% renewable energy generation // Energy Procedia. 2014. № 46. PP. 40 – 47.
3. William F. Pickard, Amy Q. Shen, Nicholas J. Hansing, Parking the power: Strategies and physical limitations for bulk energy storage in supply demand matching on a grid whose input power is provided by intermittent sources// Renewable and Sustainable Energy Reviews. 2015. № 13. PP. 1934.
4. Jami Hossain, A case study of high wind penetration in the Tami l Nadu Electricity Utility, Energy policy August 2014. PP. 868–874.
5. Andreev V.M., Zabrodsky A.G., Kognovitsky S.O. Integrated power plant with an energy storage on the basis of the hydrogen cycle // International Scientific Journal for Alternative Energy and Ecology.2017. №2 (46). PP. 99–105.
6. Zhang, H. L., et al. "Concentrated solar power plants: Review and design methodology." Renewable and sustainable energy reviews 22 (2013): 466-481.
7. Pavlović, Tomislav M., et al. "A review of concentrating solar power plants in the world and their potential use in Serbia." Renewable and Sustainable Energy Reviews 16.6 (2012): 3891-3902.


# IMPLEMENTATION OF TEST CONTROL IN THE STUDY OF TECHNICAL DISCIPLINES IN THE CONDITIONS OF ONLINE LEARNING ENVIRONMENT


**Anisimov S.**, student of group M 2.4;

***Mykolayiv National Agrarian University,Україна***

Tutor: Doctor of Pedagogical Sciences, Assosiate Professor,
Professor of the Department of General Technical Disciplines



*Стаття присвячена здійсненню тестового контролю при вивченні технічних дисциплін в умовах онлайн навчального середовища. Представлені три групи тестових питань: рефлексивні, графічні та гейміфіковані. Визначено, на розвиток яких вмінь спрямовані їх застосування під час подачі навчального контенту.*

*The article is devoted to the implementation of test control in the study of technical disciplines in the conditions of online learning environment. There are three groups of test questions: reflexive, graphic and*

*gamified. It is determined the development of which skills are aimed at their application during the submission of educational content.*

Test tasks in the context of teaching higher education students majoring in agricultural engineering are used to demonstrate a process or mechanism, with their help you can master the components of machines, the technological process of machine operation, get acquainted with the machine controls, their operation and sequence of inclusions, the dependence of the effects on the control buttons. Such a tool of the information and educational environment can be considered as a training device that simulates circumstances, actions, and creates a situation close to the real one [1]. The basis of test tasks in the information and educational environment is the use of a specific training task aimed at forming professional competencies. To master the operation of a real agroengineering installation or process, it is necessary to familiarize yourself with a virtual model, which is implemented using graphic visualization, sound and is supplemented by textual information. With the help of the educational system of the information and educational environment, the information is conveyed to the higher education student, receives feedback from him/her and provides tasks for mastering the information.

Test tasks in an information and education environment can be divided into three main groups: reflective, graphic, and gamified.

*Reflective test tasks* are based on engineering test tasks that help to master rules, techniques, laws, theorems, and other content in the field of agricultural engineering. They are a set of tasks arranged in a certain order [2]. They provide an opportunity to assess knowledge, skills and acquired competencies. These include multiple-choice, short answer, short answer, numerical answer, and calculation questions.

*Graphic test tasks* are based on training visual perception and working with engineering drawings, diagrams, and other graphic objects. Images can be supplemented with small portions of text, such as dragging and dropping images into text, text into images, or images into images, and dragging and dropping markers. This allows you to practice skills until they become automatic. Such test tasks include dragging a graphic image into a text area, focusing on working with graphic markers, and dragging text to a graphic image and image to image. The task of an engineer is to

ensure that the structure as a whole meets the reliability requirements, it is necessary to give its elements the most rational form, and knowing the properties of the material from which it will be made, to determine the appropriate dimensions depending on the magnitude and nature of the forces acting on it [3]. Therefore, when studying general technical disciplines, such as mechanics of materials and structures, it is important to solve problems and perform calculations. The implementation of these types of tasks becomes possible when using graphical test tasks in the conditions of the information and educational environment (Fig. 1).

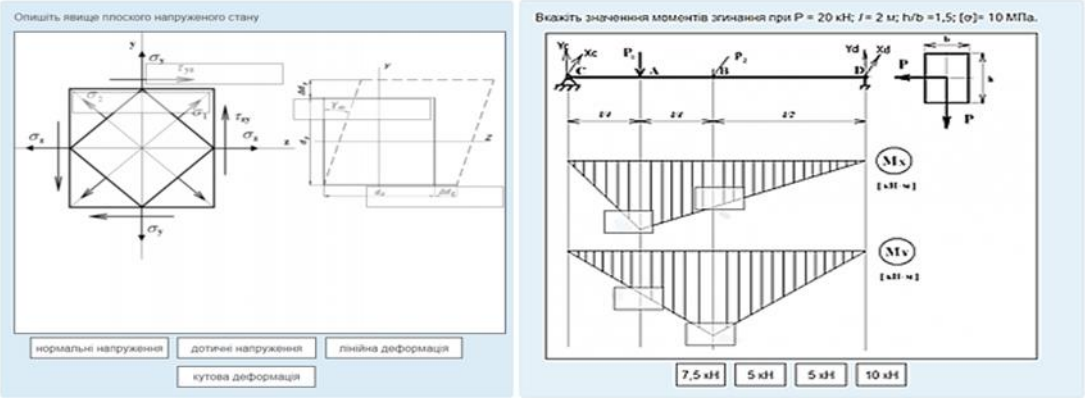


Figure 1. Examples of graphical test tasks

*Gamified test tasks* are based on a game task, which develops professional competencies. These include familiarity with the parts and devices that form the basis of agricultural engineering, the principles of teaching the operation of complex agricultural machinery; skills in installation, assembly of systems, as well as in troubleshooting and repair of agricultural machinery. These include puzzle-type tasks, crossword puzzles, quizzes, and online diagramming of agricultural processes.

The outlined types of educational test tasks expand the possibilities of using educational tools, emphasize the diversity of educational material and are able to provide quality training for higher education students based on modern needs and relevant competencies.

## *Literature:*

1. Bykov V. Y. , Open learning environment and modern network tools of open education systems. Scientific Journal of the National Pedagogical Dragomanov University, 2005. Series 2. №9 (16). C. 3-9.
2. Kukharenko V. M., Rybalko O. V., Syrotenko N. G. Distance learning: conditions of application. Distance learning course. Kharkiv: NU "HPI" TORSING, 2002. 320c.
3. Mechanics of materials and structures: a workshop for learning in an information and educational environment. Babenko D.V., Gorbenko O.A., Dotsenko N.A. Mykolaiv: MNAU, 2018. 384c.