

**TRANSDISCIPLINARY STRATEGY FOR SCIENTIFIC TRAINING:
PHYSICS AND SOFTWARE ENGINEERING**

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Abstract. Innovative activity (STEM-education, introduction of additive, digital technologies, elements of artificial intelligence, robotic systems, etc.) in the vector of development of transdisciplinary education promotes modernization of traditional educational environment, in particular in the direction of integration of physics oriented and information-technological components of scientific training, as the classic business and educational models are changing, it is possible to form personal proposals for each subject of study in the era of Industry 4.0. The authors substantiate the transdisciplinary, axiomatic-deductive, strategy of integration of scientific training according to the logical-semantic construct «physics ↔ software engineering» in the open space, which will provide unification and standardization of information in the context of physical engineering education (for example, 272 «Aviation transport», under the educational and professional programs «Maintenance and repair of aircraft and aircraft engines» and «Flight operation of aircraft»).

Keywords: Software Engineering, Physics, STEM, Open Science, Transdisciplinary Strategy, ECO-environment.

Introduction. The development of a transdisciplinary strategy for the integration of physics and engineering training of scientific personnel will give impetus to the development of relevant and demanded by the global market innovative STEM-research topics aimed at creating innovative solutions for science, education and economics in the conditions of open science.

Research result. According to the results of the research, there is no systematic holistic theoretical and methodological research of the problem of transdisciplinarity in the training of scientists in «Physics» and «Software Engineering», as transdisciplinary aspects of the innovative scientific and educational ECO-environment in this sense is the main a fundamental feature of the development of modern science, which combines theoretical knowledge into a

holistic system, reflects the objective world in its unity, the development and fundamentalization of physics-oriented and IT areas of training [1]. The present an axiomatic-deductive transdisciplinary strategy for the integration of physics oriented and IT-training of scientific personnel in open space; developed a model of ECO-environment information-analytical system in the block of physical engineering education on an adaptive basis, taking into account the provisions of STEM-education, and implemented innovative learning technologies (STEM, Internet of things, IoT, robotics, etc.) in the educational process training of scientific personnel in technical institutions of higher education.

The experiment and expert evaluation of the results of a transdisciplinary, axiomatic-deductive, strategy of integration of physics-oriented and IT training of scientific personnel showed positive changes in all indicators (evaluation of strategy, model, methodological system) using STEM technologies and confirmed the main goals and hypotheses.

Conclusions. The transdisciplinary, axiomatic-deductive strategy of integration of physics-oriented and IT-training of the scientific staff of technical institutions of higher education is outlined in the following areas: virtualization (Integration, Digital Twin) and the use of Digital by Default; development of the Internet of things; development of methodological and consulting support for transdisciplinary links in Physics and Software Engineering, expansion of contacts in line with international and domestic stakeholders in the vector of innovation – STEM-education in open science.

Emphasis is placed on the prospects of introducing a methodology of transdisciplinarity for the development of an integrated onto-oriented ECO-environment of the information-analytical system of training scientific personnel for the integration of physics oriented and information-technological areas.

References

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