

DEVELOPMENT OF A FUZZY COGNITIVE MAP MODEL FOR CREATING STEM PROJECTS IN PROFESSIONAL TRAINING OF FUTURE SPECIALISTS IN ENGINEERING AND PEDAGOGICAL SPECIALTIES

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The article examines the issues of STEM education development in the context of the strategy for the development of higher education in Ukraine for 2022-2032. In particular, the emphasis is on the importance of reorienting the educational process to the training of specialists in engineering and pedagogical specialties with practical skills and up-to-date knowledge. It is necessary to strategically rethink educational approaches, giving priority to the training of specialists in engineering and pedagogical specialties who possess not only theoretical knowledge, but also specific practical skills that meet the requirements of the labor market. Special attention is paid to STEM education, which is defined as a key tool in the formation of competencies for future specialists in the field of engineering and pedagogy. This approach involves not only the transfer of theoretical knowledge, but also emphasizes practical aspects, contributing to the development of specific skills and abilities that are necessary in practice. Dedication to STEM education in the context of engineering and pedagogical fields allows future specialists to be ready for the challenges and tasks presented to them by modern labor markets, and to meet the current requirements and standards in these fields. The technical orientation of STEM projects contributes to the implementation of practical tasks and the formation of skills in demand on the labor market.

The purpose of the article is to present the algorithm for building a lighting control system prototype using the example of the STEM project "Lighting control system in the library". For building a logical model, to justify the structure of the system, the NCC is used. The development of the STEM project "Lighting control system in the library" is presented, which involves the creation of a fuzzy cognitive map in the Mental Modeler environment.

An algorithm for building a logical model for a STEM project under conditions of uncertainty has been developed and described. The basis of the built model is a cognitive map. A cognitive map is a symbolic directed graph, at the vertices of which the key factors of the object of modeling (concepts) connected by cause-and-effect relationships are placed.

A cognitive map is a type of mathematical modeling used to formalize a complex system in the form of a set of concepts that reflect system factors and causal relationships between them, taking into account the nature of their interaction.

Based on the analysis of the logical model of the system, it was determined that for each concept it is necessary to set the level of communication on the visual form of the Mental Modeler map, which allows you to set the level of assessment of its dependence.

The paper presents a logical model on the example of a prototype of a computer lighting control system in a library using fuzzy logical derivation. Fuzzy cognitive maps were used to justify the structure of the management system. The sequence of building a prototype of the lighting control system in the library and the analysis of the parameters of such a system can be used by students of engineering and pedagogical specialties for the educational purpose of building various STEM projects.

Cognitive modeling methodology is used for analysis and decision-making in conditions of uncertainty. It is developing in the direction of improving the situation analysis and modeling apparatus. Therefore, to implement a STEM project in ill-defined situations, it is advisable to build a logical model. It defines the structure of the modeled system. The basis for building this model is a fuzzy cognitive map.

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