ABSTRACT

Explanatory note size – 89 pages, contains 16 illustrations, 72 tables, 2 applications, 13 references.

Topicality. Examines the need for developing intelligent automated testing systems capable of adapting to users' level of preparedness and individual needs, as well as generating recommendations for further learning. The integration of artificial intelligence algorithms into educational web applications ensures a personalized learning experience, enhances the quality of knowledge acquisition, and supports the formation of individual learning trajectories.

The aim of the study. The main target is to improve the efficiency of knowledge assessment by integrating artificial intelligence algorithms for generating and evaluating test questions.

The object of research: software for automated knowledge testing.

The subject of research: methods and algorithms of artificial intelligence applied to the development of automated testing systems.

To achieve this goal, the **following tasks** were formulated:

а) to analyse existing automated knowledge-testing systems and identify their advantages and limitations;

б) to develop functional, architectural, and interface requirements for the web application;

в) to design a method for generating test questions using artificial intelligence algorithms;

г) to develop a method for producing personalised recommendations for the user;

д) to implement the web application using modern web technologies (React, Node.js, PostgreSQL);

е) to evaluate the effectiveness of the proposed approach.

The scientific novelty of the results of the master's dissertation is the enhancement of integration methods for machine learning algorithms aimed at automated generation of test questions and production of personalised

recommendations. This approach increases the effectiveness of self-assessment for learners and supports the formation of individual learning trajectories for mastering educational content.

The practical value of the obtained results is the possibility of implementing the developed web application for users' personal learning and self-development. Owing to its personalised approach, the system can improve learning efficiency and provide high-quality knowledge assessment.

Relationship with working with scientific programs, plans, topics. Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

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Publications. The scientific provisions of the dissertation were published in:

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