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TECHNICAL STRUCTURE OF VIRTUAL LABORATORY COMPLEXES

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ABSTRACT: This article presents the technical structure of conducting laboratory training in the field of "Automobile theory", which is considered the main basic science for the educational direction of transport engineering, in the context of the TechVLab program.

KEYWORDS: Virtual laboratory complexes, TechVLab, technical structure.

INTRODUCTION

The world around us, society, people, technologies, everything is changing at a great pace. Such objective changes require sharp turns and modernization in many fields. In particular, in the modern education system of the existing world, radical changes and retreats are taking place in the previously developed conditions, which, in turn, creates the need to create new educational environments. The importance and main essence of this task is that it is not enough to transfer and adapt old materials and methods to this environment, although this is not easy either, on the contrary, it is necessary to open new reserves, potential opportunities, to find them and to use them fully [1,3,4].

In the new development strategy of the Republic of Uzbekistan for 2022-2026, it is necessary to introduce the national program for the development of the education system and provide them with the necessary equipment to acquire knowledge and skills in the field of information technologies. Also, by 2026, curriculums and textbooks will be fully revised based on advanced foreign experience and implemented, and new textbooks, workbooks, methodical books, and mobile applications will be created based on the national curriculum. A number of tasks, such as the introduction of a system of trial-testing of teaching-methodical complexes and expertise with the participation of foreign experts, have been defined[2,5,6].

Based on the above tasks, it is necessary to further improve the higher education system, in accordance with the priority tasks of the socio-economic development of our country, to revise the meaning of personnel training, to create conditions for the training of highly qualified specialists at the level of international standards.

The analysis of scientific research and literature on the problem of research work shows that although many scientific research works have been carried out on the problem of formation of professional competencies in students, but 60711400-"Transport engineering" of higher educational institutions very little attention is paid to the issues of formation of professional competencies and improvement of its methodology in future engineers studying in the field of education[7]. It researches the possibilities of learning and improving the set of teaching tools,

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forms, methods and pedagogical conditions that influence the effectiveness of the formation of professional competencies in preparing students of this field of education based on modern approaches.

Based on the above, it is necessary to use modern pedagogical technologies in conducting laboratory classes in the subject "Automobile theory", which is considered the main basic science for the educational direction of vehicle engineering-60711400 in the higher education system. Therefore, as we know, laboratory equipment and road conditions are necessary for laboratory training in vehicle engineering. This requires a lot of inconvenience and a lot of money. Therefore, these trainings can be conducted using virtual laboratories using modern pedagogical technologies and methods.

It is possible to conduct the following laboratory exercises in the field of "Automobile theory" in a virtual state:

- Determining whether the car can cross road obstacles;
- Determination of the total resistance of the road;
- Determination of transverse stability of the car;
- Determination of air resistance to the car and its center of sail.

With the help of the TechVLab program, it is possible to conduct laboratory exercises on the subject of "Automobile theory". The technical structure of these virtual laboratory complexes is presented as follows (figure 1):

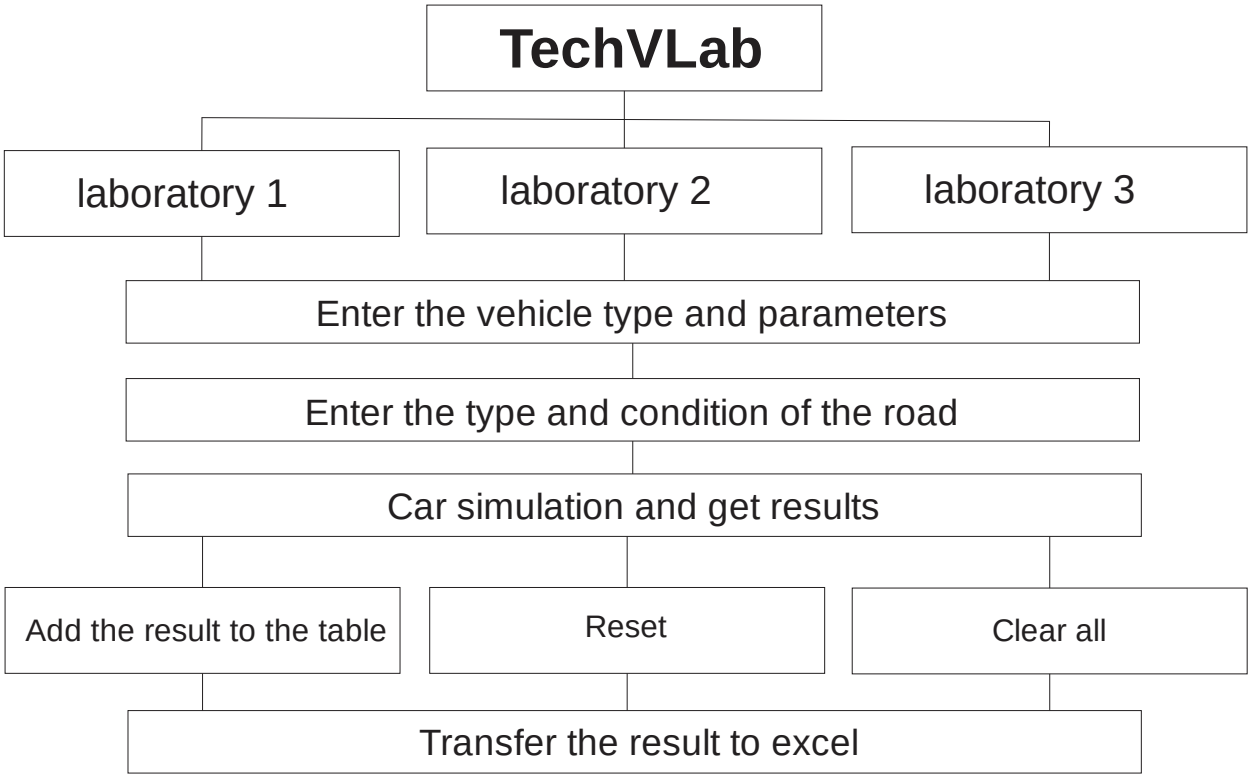

Figure 1. Technical structure of virtual laboratory complexes

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With the help of the TechVLab program, you can perform 3 laboratory exercises on the subject of "Automobile theory". These are: determination of the car's passability over road obstacles; determine the total resistance of the road; determination of transverse stability of the car. With the help of a virtual laboratory, a type of car is selected and its parameters are entered in each session. After that, the type and condition of the road for the car is selected. The car is simulated according to the selected parameters and its results are obtained. The results can be added to the table, reset or cleared. The results obtained from the experiment can be copied to excel (figure 2).

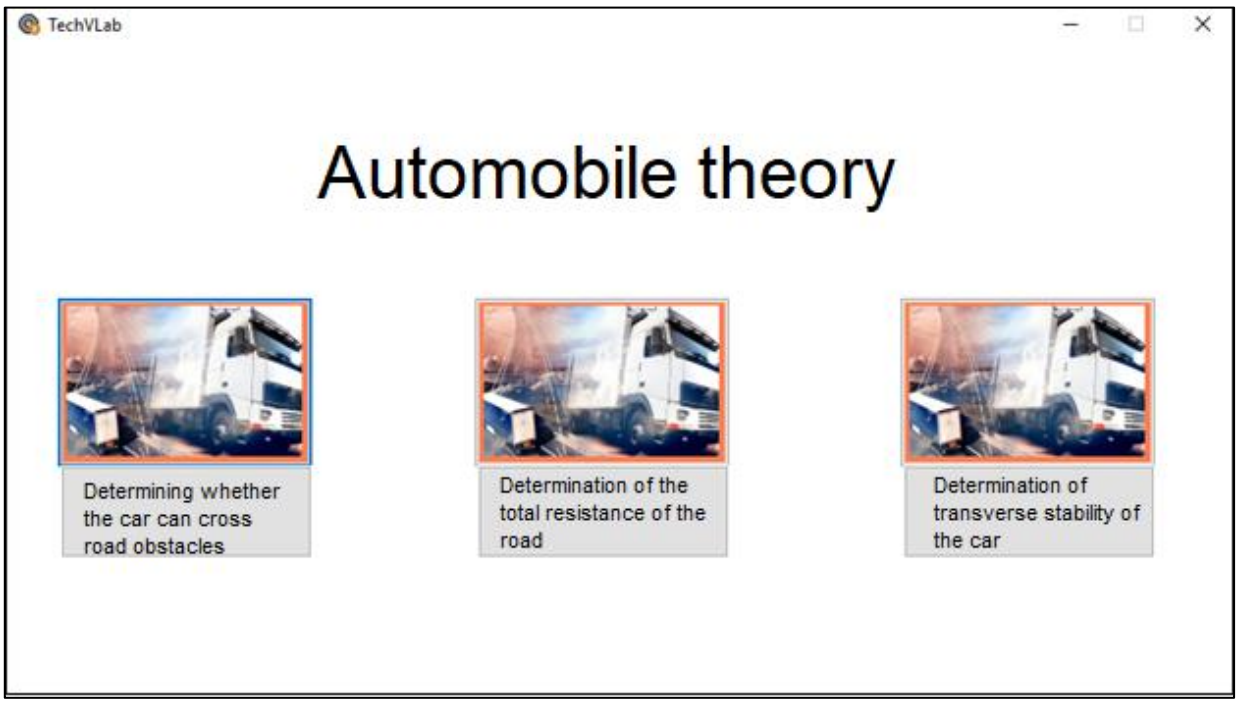

Figure 2. TechVLab program

CONCLUSION

In conclusion, with the help of this program, a student can perform laboratory exercises in a virtual state. This process can be performed several times and using different methods and the results obtained can be compared. It helps engineer pedagogues to develop professional competencies.

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