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THE USE OF COMPUTER MODELING IN THE EDUCATIONAL PROCESS

The modern period of development of society is characterized by a strong influence on it of computer technologies that penetrate into all spheres of human activity, ensure the spread of information flows in society, forming a global information space. An integral and important part of these processes is the computerization of education.

Modeling as the construction and study of models of real objects and phenomena is the most important method of research. The main feature of such studies is the method of indirect cognition, in which the original object under study is in some correspondence with another object model, and the model is able to replace the original to one degree or another at some stage of the cognitive process.

With the advent of computer technology, modeling has received a new and very powerful resource for its implementation, since traditional analytical methods for constructing models were supplemented by the capabilities of computer computing. In this case, the calculations are carried out automatically, in accordance with the specified algorithm and do not require human intervention.

Computer modeling is a set of analysis and synthesis of a complex system based on the use of a computer. It involves the use of computer programs that simulate physical experiences, phenomena or idealized model situations occurring in physical processes.

The purpose of our research is to improve the methodology of applying modern information technologies in the educational process. Computer modeling is considered by us as a method of analyzing real or expected physical processes using computers, when

processes are modeled according to a given sequence of physical mechanisms.

In the implementation of the subjects of the technical (engineering) cycle, the modern method allows to move from traditional methods of teaching design to modeling using CAD-systems, followed by the use of CAE/CAD automated complexes, one of which is a 3D system of hybrid or computer-aided design, engineering analysis and preparation of production of products of any complexity and purpose of SolidWorks.

One of the sources of this program is SolidWorks Simulation, which conducts:

- calculations for the strength of structures in the elastic zone;
- setting in and solving contact problems;
- calculations of compilations;
- determination of natural forms and frequencies of oscillations;
- calculations of structures for stability;
- calculations for fatigue;
- imitation of falling;
- thermal and nonlinear calculations (taking into account nonlinear properties of the material, nonlinear load, calculations of nonlinear contact problems);
- analysis of fatigue stresses and determination of the life of structures;
- linear and nonlinear dynamics of deformed systems.

Thus, with the help of SolidWorks Simulation, the following details of automotive equipment were investigated: the primary shaft of the gearbox of the GAZ-24 car (fig. 1); shaft-gear of the rear axle of the UAZ-31512 car (fig. 1, b); the axis of the rotor of the water oil heat exchanger and the lubrication system of the diesel engine SMD-31 (fig. 1, c – [1]); shaft-gear rotary mechanism in the rocking excavator (fig. 1, d); piston of the energy accumulator of cars and road trains KamAZ (fig. 1, e); clutch shaft of the tractor DT-75M (fig. 1, f); shaft-gears of the main gear of the rear axle of the GAZ-53 car (fig. 1, g); steering bipods of the car Izh-2126 (fig. 1, h – [2]); shaft-gears of the transfer case of the UAZ-3741 car (fig. 1, i – [3]); shaft-gears of the gearbox of the rear axle of the GAZ-53 car (fig. 1, j).

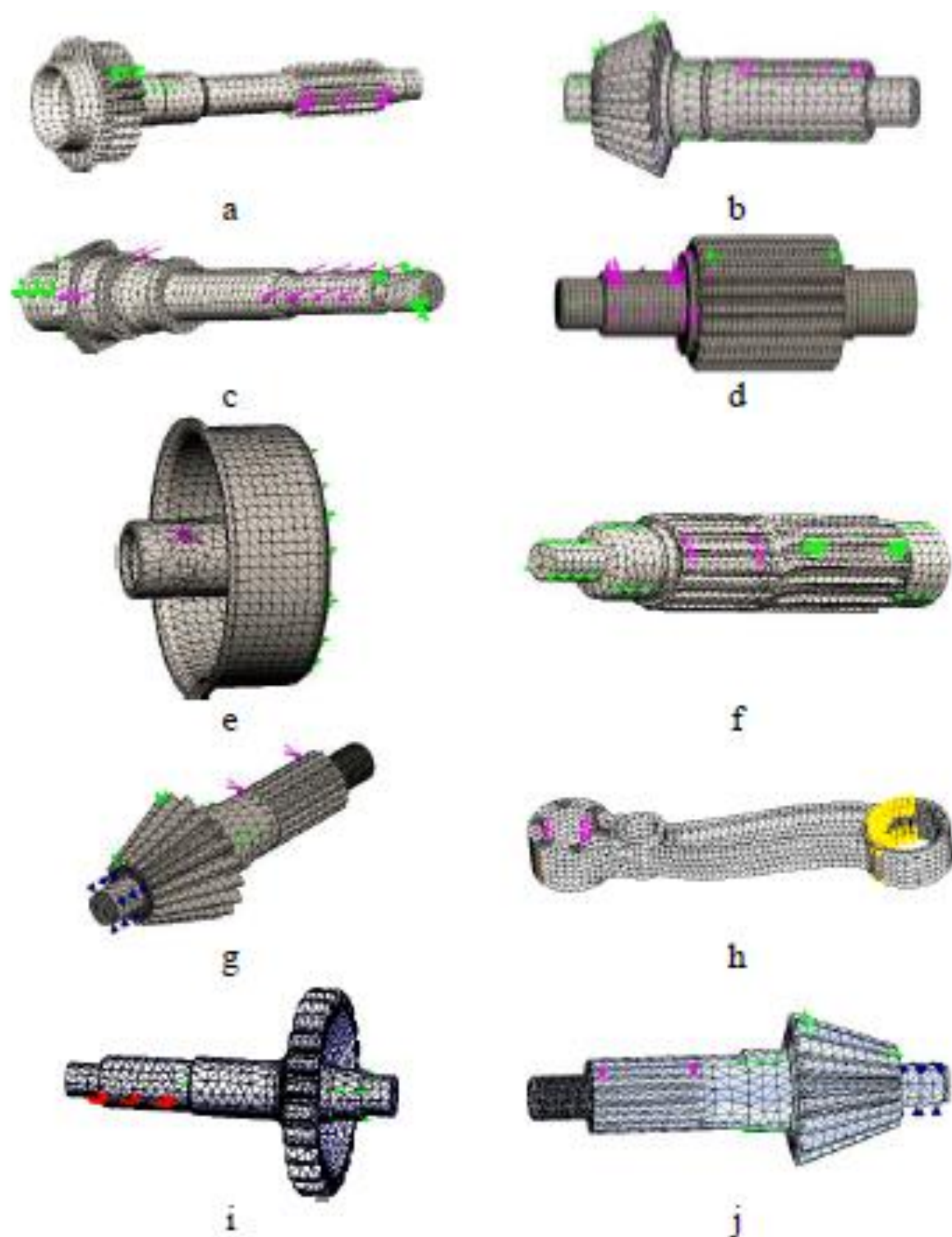


Figure 1 – Details automotive equipment with the display of the grid on a solid (SolidWorks Simulation)

Thus, to the real experiment supported by a computer, modeling methods are one of the most advanced methods of computer learning.

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NO TALKING HEADS PLEASE: RESULTS OF A SURVEY ON INSTRUCTIONAL VIDEO

Upon completing a course of educational technology students of education majors were offered a survey on the effectiveness of instructional video. The respondents indicated that instructional video is a major factor in education. Open-ended questions yielded multiple views on the desired format and parameters of instructional video. The survey suggests that student perceptions of an effective instructional video have a wide range of differences to the point of being opposite. However, some patterns can be established.

Setting and purpose of the study

Amidst the current online teaching/learning practices students are exposed to multiple instructional videos, some created by video professionals, some by instructors and even students. The goal of this