

Technology of Perfection of Knowledge Transfer and Acquisition on the Basis of Computer Simulation Models

Tukhtasinov I. M¹, Lutfillaev M. H², Abdullaeva S. A³, Mamadalieva N. S⁴, Lutfillaeva F. M⁵, Fayziev N. A.^{6,*}

¹Rektor of Samarkand state Institute of Foreign Languages, Doctor of Pedagogical Sciences, Samarkand, Uzbekistan

²Head of Information Technologies Department, Samarkand state Institute of Foreign Languages, Doctor of Pedagogical Sciences, Samarkand, Uzbekistan

³Doctor of Pedagogical Sciences, Professor of Pedagogy Department, Uzbek National University named after Mirzo Ulugbek Tashkent, Uzbekistan, Universitetskaya street, 4 Samarkand, Uzbekistan

⁴Doctor of Philology, Uzbek National University named after Mirzo Ulugbek Tashkent, Samarkand, Uzbekistan

⁵Teacher of Oriental Languages Department of Samarkand State Institute of Foreign Languages, Samarkand, Uzbekistan

⁶Teacher of Information Technologies Department, Samarkand State Institute of Foreign Languages, Samarkand, Uzbekistan

*Corresponding author: nozim@samdchi.uz

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Abstract This project explores the design and implementation of virtual resources in the learning process on the basis of computational simulation models for higher educational establishments.

Keywords: simulation model, animation, imaginative thinking, logical thinking, virtual laboratory, multimedia technology, methodological system.

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1. Introduction

Computer modeling is a new and rather complex direction in the cycle of information disciplines. Because computer modeling (CM) involves the interrelationships of various disciplines for its successful mastering, a wide variety of knowledge is required: first of all, knowledge in the chosen subject area - if we model physical processes, we must have a certain level of knowledge of the laws of physics, modeling ecological processes - biological laws, modeling economic processes - knowledge of the laws of the economy, in addition since computer simulation uses almost the whole apparatus of modern mathematics, it is assumed knowledge of the basic mathematical disciplines - algebra, mathematical analysis, theory of differential equations, mathematical statistics, theory of probability and modern means of information technology. To solve mathematical problems on a computer it is necessary to master in full numerical methods of solving nonlinear equations, systems of linear equations, differential equations, to be able to approximate and interpolate functions. And, of course, we are supposed to have fluent knowledge of modern information technologies, knowledge of language programming and knowledge of application development skills [1,2,3].

Computer modeling emerged as one of the directions of mathematical modeling with the development of information computer technologies has become an

independent and important field of application of computers. At present computer modeling has become one of the main methods of cognition in scientific and practical research. It is impossible to solve major scientific and economic problems without computer modeling now. It has been developed a technology for studying complex problems based on the construction and analysis with the help of computer technology of the mathematical model of the object under study. This method of investigation is called a computational experiment (CE).

Computational experiment is applied practically in all branches of science - in physics, chemistry, astronomy, biology, ecology, even in such purely humanitarian sciences as psychology, linguistics and philology. Except scientific fields, computing experiments are widely used in economics, sociology, industry, management. The computational experiment has a number of advantages over the so-called full-scale experiment:

- it doesn't require complicated laboratory equipment;
- significant reduction of time spent on the experiment;
- the possibility of flexible control of parameters, their arbitrary modification, up to giving them unrealistic, implausible values;
- the possibility of carrying out a computational experiment where the field experiment is impossible because of the remoteness of the phenomenon being studied in space (astronomy) or because of its considerable time stretch (biology) or because of the possibility of introducing irreversible changes in the process under study.

2. Methodology

Computer technologies enriched with modern advances in computer science and information technology, introduced into the learning process in all natural-mathematical and social-humanitarian disciplines, which contribute to the fullest realization of the computer simulation approach to cognition and transformation of reality, is one of the important means of implementing the continuity of education received by young people generation in secondary general and higher schools.

The object of research is computer simulation of higher education subjects. The aim of the work is to develop a methodology for creating computer simulation models for lecture, practical and laboratory classes in higher education subjects.

The virtual resources created by the English language subjects provide the opportunity to use lectures in the learning process, as well as facilitate practical lessons, and to use them as a visual weapon. The creation of these tools for students serves as an important basis for studying and mastering English.

The virtual resources created on the basis of ICT in English at WIUT will be used in Uzbekistan for the first time in the educational process on the basis of new pedagogical technologies. Teaching process of higher education on the basis of virtual resources created on the subjects of English requires the use of information and pedagogical technologies [8,9,10,11].

The creation of virtual resources on the English language in the process of learning is fundamentally different from other existing multimedia technologies. Because of this, virtual resources have elements of national identity, on the basis of which youth learn the language and national values of the nation and language in which the language is taught in language learning.

Nowadays, Samarkand State Institute of Foreign Languages conducts scientific researches on creation of electronic versions of virtual resources in English language in higher and secondary special education and selection of themes on simulation models is carried out by the professors of Samarkand State Institute of Foreign Languages. The following topics are selected for electronic versions of emails and simulation models, so computer simulation models are created and being implemented into the learning process.

3. Results and Discussion on the Subject "Countrystudy"

Computer simulation models have been created for the subject "Countrystudy".

1. General information about the UK (Great Britain, geographical position: British Isles, the difference between the United Kingdom and Great Britain, Landscape, Climate, Population.

2. History of Great Britain (Historical scheme: Historical data on the country.

3. Major UK parts (UK, Scotland, Wales). Geography of England, counties and their marks. UK industrial centers. Use of audio and video equipment to cover history, geography and population. Northern Ireland.

4. The British Government. Monarchy. Political parties. (Official name of the State: National Flag, Monarchy, British Parliament, Prime Minister, Cabinet of Ministers, Royal Family, Labor Party, Elections.

5. British education system. (Public schools, private schools). Universities. Oxford and Cambridge University Educational Institutions.

6. British Customs and Traditions (Holidays and Festivals, The Beatles Group, Scottish Group, The BBC)

US geographical location. Landscape. Population. Climate. U.S. Government. Presidents of the United States. Education system. American Universities. Public Schools, Students, Campus. Private schools. Higher Education Institutions.

8. American holidays. Theater and Cinema. Independence Day. Thanksgiving Day.

9. Canada. Geography. Political system, government. Main Cities. Wide industrial centers.

Computer simulation models were created for each of these topics.

Subject: English Major (Peoples and Personalities, National Identities and English Speaking Countries. Food, Health, Family, Family values, Cities and country life, Leisure and sport. Technology and communication, Uzbekistan and the world, Work and business, Environment, Relations, Cross-cultural communication).

Computer simulation models have been created to expose the content of these topics. In Imaginary models, the subject of the "English Major" is expressed and explained by the method of imitation, which is a remarkable and important source of information in the history, traditions, geographical location of the country studied. One of the advantages of these simulation models is that students or learners are able to work independently out of class and get distance learning.



Figure 1. A computer simulation model that represents the historical background of Great Britain

Virtual resources are created on the basis of computer simulation models of "Countrystudy" and "English language major" and "Introduction to German philology" subjects.

For example, the following is the simulation models of the subject "Countrystudy".

In this simulation model (Figure 1), the historical process of the Great Britain will be illustrated and explained. The Simulation model provides information on the origin, nationality, population, mineral resources, state language, religion, weather, flora and fauna of the United Kingdom, and the United Kingdom of Great Britain, Scotland, Wales and Northern Ireland. This simulation model also shows that the UK borders with the North Sea in the North, the North Sea in the east, the West Bank, the La Manche Strait and the French Empire [7-11].

In addition, brief information on each object is displayed through hyper reference.



Figure 2. Simulation model that shows the UK's warm climate

This simulation model illustrates hot climate of the UK, that moderates warmth of the Gulf Stream. In the simulation model the direction and temperature of the hot stream (Gulf Stream) and effects of the washing and imaging of the coastline are imitated.



Figure 3. Simulation model that describes the landscape of the UK

This illustration shows the influence of the sea on nature of Great Britain, its division into three natural regions, and simulation model of the hills and mountains, fertile land, and large-leaved forests of these regions (Scottish, southwestern England, Wales and Mountain Anglia), full information about similarly, virtual sources

of computer simulation models have been created and used in the educational process for natural sciences (45 subjects in biology, physics, and information technologies) [5,6,7].

Within the framework of this simulation project it is aimed to prepare animation program, providing information about Uzbekistan on the topic Countries, on the subject "English major". On the account of the fact that students of Translation theory and practice department are future translators and interpreters, they are supposed to work with guests and tourists visiting our country. Any guest and tourist visiting our land is always eager to learn about Uzbekistan. Therefore, it is required by the curriculum that future interpreters know considerable amount about Uzbekistan and can fluently communicate on this topic. In order to facilitate the learning process, as well as increase the quality and effectiveness of the education process, it is crucial to implement innovative and interactive methods, namely, effectively integrate informative communication means in the lessons, present materials in various forms, methods and variants that will increase the quality of education and effectiveness of learning. Therefore, it is reasonable to implement simulation projects in such cases. Simulation project involves materials on Uzbekistan, its culture and cities in English as well as assignments checking the learned materials. Among cities information about Samarkand, its history, architectural and historical buildings and monuments is presented one by one. Photo and video materials will be supplemented to the animation program.

If students learn topics about environment and nature surrounding them with the help of animation programs and computer graphics it will be easier for them to learn the lexis and at the same time they will do the assignments improving their speech on environmental problems and find solutions to them.

As human being is a higher gift of the nature, it is very important to learn information about human body and acquire the skill of being able to speak and describe human appearance and movements of human body.

Changes, ailments and illnesses of human and human body can be carried out with the help of computer programs as well.

As human being is a member of the society, it is possible to provide students in simple way with the animation program the relations between people in the society, their agreement and disagreement, obedience and disobedience to the law.

This simulation project can be used in teaching and learning English not only by the students of Translation theory and practice department but by all students of higher educational establishments. As the requirement of present time for all spheres is to know a foreign language, this project can be of great importance for the development of language skills in learning and presenting their knowledge of English in their specialty [8-11].

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