

Effective Learning Technologies in IT for Children

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Abstract — Today Russian higher school is faced before the demographic gap because of the low birth-rate reasoned by the first years of “perestroika”. Since 2009 Russia started the standard procedure of students admission to the universities based of state test written exam (Uniform Graduation Examination). That’s why the competition between Russian universities in attracting good students is getting higher. It’s evident that it’s necessary to start this process as soon as possible. Information technologies is a very popular field of studies today. In Saratov State Technical University (SSTU) there was developed a special effective system of working with schoolchildren which allows to prepare good students. The system includes: Kids Computer School, special Olympic Games in Programming for schoolchildren, competitions in IT for kids and teenagers. Kids computer school exists at SSTU since 2000 and attract students from 9 years old till 16. Project-oriented student’s based approach, special system of training of teachers, organization of competitions between students projects increase students motivation and effectiveness of education as a whole. More than 90% of graduates of kids computer school become university students each year. Carefully developed curricula in popular information technologies and innovative methods of training attract more than 500 young students annually. Today computer school includes the following directions of education: computer graphics & multimedia, Internet technologies, programming technologies, development of computer games. Developed teaching methodologies and books for teachers and students allowed to make the stable system of IT education and to teach children modern professional technologies. For example, program of computer graphics & multimedia includes studying of the whole set of computer graphics and modern software: 2D-graphics (Adobe software, Corel Draw), computer animation (Toon Boom software, Adobe Flash), 3D-graphics and animation (3D Max, Maya), digital video (Adobe Premier, Adobe After Effects). Studying of the whole set of technologies the student to develop the project combining all technologies: video, 2D and 3D animation. Projects developed by the students participate in computer competitions of various level: Kids Computer School, University, Regional, All-Russian, International. Each year SSTU organizes “Digital Wind” as International Competition in Internet and Multimedia technologies which attract more than 1500 young participants from many countries and assist to attract good students to the university. Special Olympic Games in programming for schoolchildren aged 15-17 years old organized by the university twice a year allow to select talented potential students for undergraduate programs in IT and Software Engineering.

Index Terms — Kids Computer School, university admission, computer graphics, programming.

LEARNING TECHNOLOGIES

Today Russian higher school is faced before the demographic gap because of the low birth-rate reasoned by the first years of “perestroika”. Since 2009 Russia started the standard procedure of students admission to the universities based of state test written ex Kids Computer School, university admission, computer graphics, programming am (Uniform Graduation Examination). Today school graduates could send the results of the UGE to several Russian universities. That’s why the competition between Russian universities in attracting good students is getting higher. It’s evident that it’s necessary to start this process as soon as possible. Information technologies is a very popular field of studies today. In Saratov State Technical University (SSTU), Russia there was developed a special effective system of working with schoolchildren which allows to prepare good future university students. The system includes: Kids Computer School, special Olympic Games in Programming for schoolchildren, competitions in IT for kids and teenagers. Kids computer school (KCS) exists at SSTU since 2000 and attracts students from 9 years old till 16. Since 2008 the project KCS is supported by Softline company, famous in Russia and CIS. Project-oriented student’s based approach, special system of training of teachers, organization of competitions between students projects increase students motivation and effectiveness of education as a whole. More than 90% of graduates of kids computer school become university students each year. Carefully developed curricula in popular information technologies and innovative methods of training attract more than 500 young students annually. Today computer school includes the following directions of education: computer graphics & multimedia, Internet technologies, programming technologies, development of computer games. Developed teaching methodologies and books for teachers and students allowed to make the stable system of IT education and to teach children modern professional technologies. For example, program of computer graphics & multimedia includes studying of the whole set of computer graphics and modern software: 2D-graphics (Adobe software, Corel Draw), computer animation (Toon Boom software, Adobe Flash), 3D-graphics and animation (3D Max, Maya), digital video (Adobe Premier, Adobe After Effects). Studying of the whole set of technologies the student to develop the project combining all technologies: video, 2D and 3D animation. Projects developed by the students participate in

computer competitions of various level: Kids Computer School, University, Regional, All-Russian, International. Annually SSTU organizes "Digital Wind" event (www.digitalwind.ru) as International Competition in Internet and Multimedia technologies which attract more than 2500 young participants from many countries and assist to attract good students to the university. Age of Digital Wind participants is from 5 till 21. Participants compete in 2D and 3D graphics, web-design, development of computer games. The competition is officially supported by Russian Ministry of Education and Science.

Kids Computer School includes also the special system of teachers retraining. It pays attention not only to studying computer technologies and software but to methods of training as well. After training the teachers should pass certification exams in All-Russian testing system ALLTESTS in order to get status of KCS trainers. Students of KCS could pass also the special tests for students if they want to get students ALLTESTS certificate.

Today KCS includes not only School of Computer Graphics & Animation but Internet School, Programming School, School of Development of Computer Games and Sunday Computer School. Curriculum of each school includes 250 academic hours of training (except Sunday School). Typically students have 6 contact hours per week + self-studying. Usually most of students come to KDS for the first time to Sunday School where they study basics of web-designing, computer design. After 1 year of training students with the help of teachers could define their abilities and select School of Computer Graphics & Multimedia or Internet School or School of Computer Games or Programming School.

The other effective form of working with school children are Special Olympic Games in programming for schoolchildren aged 15-17 years old organized by the university twice a year allow to select talented potential students for undergraduate programs in IT and Software Engineering. After special selection procedure school children spend 1 week at SSTU summer students camp on the picturesque bank of the Volga river. During this week the professors of SSTU give lectures and practical labs for school children. One must mention that it's important to define the theme of the 'Olympic Games' – it must be not boring for teenagers, from one side, and from the other side, it should include modern information technologies. For example, the them could be 'Development of War Robots Strategies' while the programming language which is taught at the 'Olympic Games' could be Java. During 1 week participants study war robots strategies and develop Java-applications of war robots. The final day is devoted to the competition in developed war robots and the winner will get the prize.

All these forms of preparation of kids for university allow to attract good students.