

**OPINION STUDY FOR THE LEVEL OF INTEGRATION OF INFORMATION AND
COMMUNICATION TECHNOLOGIES IN THE BULGARIAN SECONDARY
EDUCATION IN TECHNOLOGIES**

Lyubima Zoneva, Ph.D

South-west University “Neofit Rilski” – Blagoevgrad, Bulgaria, zoneva@swu.bg

Abstract: The integration of the contemporary information and communication technologies in the education is objectively determined by the regularities of the technological social development, social educational requirements and the needs of the youngsters that grew up in a highly technological informational environment. The improvement of the quality of the learning activity and the entire transformation of the education through the means of the information and communication technologies is an important goal of the Bulgarian educational policy.

The secondary technological education as a social phenomenon holds a significant place for the formation of the technological culture of the students who will seek professional realization in the dynamically changing society of the XXI century.

The digital technological integration in the secondary technological education is identified as extremely complex and developing in stages process of progressive modifications until it reaches the level of entire modification, a process during which the information and communication technologies become a definite tool for teaching and learning. Each level of integration features up to a certain level the unification of the pedagogical and digital information and communication technologies and the specific characteristics of the new integrated technologies. The high level of integration of information and communication technologies in the pedagogical practice created conditions and prerequisites for the so-called personalization of the learning.

The complex nature of the process of integration requires the application of a complex approach and the use of instrumental means for research that are in coordination with the specifics of the subject field of the technological learning. The requirement for an increased independence and responsibility to learn of the student himself and the active practical characteristic of the technological education predispose active participation of the learners in the determination of the applied and preferred forms and means of computer aided studying. Featuring the practices of using information and communication technologies in the learning process, the organization of the environment and the level of independence in choosing the digital tools is an important condition for the determination of the achieved level of the digital technological integration. The study of the students’ opinion is an important part of the complex evaluation of the integration process and a direction for improvement of the specific methodological practice.

The article presents the outcome of a research, conducted in 2014 with 223 students to determine their attitude, expectations and ways to use information and communication technologies in their learning of certain subjects of classification of learning fields “Lifestyle and technologies” in the secondary school. The summarized results give an idea for the level of informatization of the technological education. The registered levels and the stated students’ preferences are the base to form some particular conclusions, directed towards the educational policy and methodological practice.

Keywords: digital integration, technological education, information and communication technologies, informatization.

1. INTRODUCTION

Contemporary socio-cultural reality and characteristics of the information society place new demands on education. We need new skills and competences, new life and career development skills. Mastery of new multivariable capacities suggests not only changes in educational standards but also innovation of the educational process... Overall modernization and transformation of education and science by means of Information and Communication Technologies (ICT) to achieve measurable and compelling value indicators improving the quality of education is a major goal in the Bulgarian Strategy for Effective Implementation of ICT in Education (2014-2020). (Ministry of Education and Sciences, 2014:8).

The need for system integration of digital information and communication technologies in teaching different subjects is objectively determined by the laws of technological social development, social educational requirements

and needs of students who grew up in a high-tech information environment. The high degree of integration of ICT in teaching practices creates the conditions and prerequisites for personalization of education.

Junior high school technical education as a social phenomenon has a significant role in the formation of technological culture of students to be qualified to work in the dynamically changing society of the 21st century. The basic documents of the International Technology and Engineering Educators Association (ITEEA) state that the goal of technology education is to give people tools to participate intelligently and meaningfully in the surrounding highly technical world. A main remedy for its modernization in terms of global informatization is the integration of ICT in the educational process.

Digital technology integration in junior high school technical education is identified as an extremely complex, gradually evolving process of progressive changes to the point of a complete conversion, a process in which ICT is gradually becoming a crucial tool for teaching and learning. Different levels of integration are characterized by varying degrees of uniting teaching and digital information and communication technologies and specific features of the new integrated technologies.

2. CHARACTERISTICS OF THE STUDY CONDUCTED WITH STUDENTS

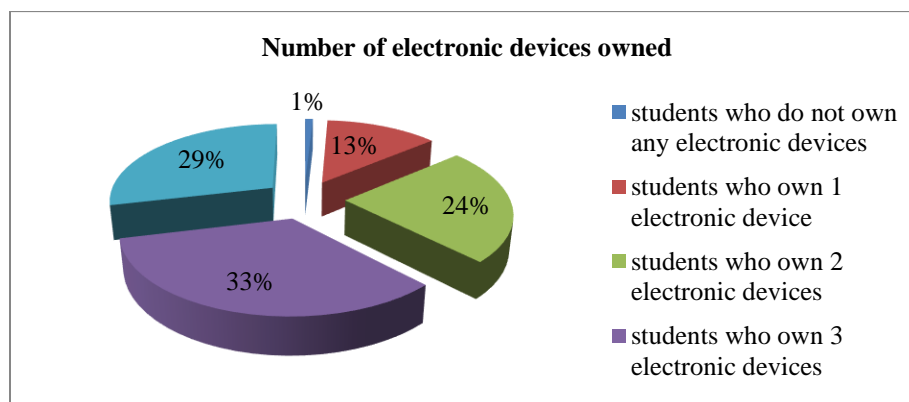
The complicated nature of the integration process requires the implementation of an integrated approach and use of software tools for study, conformed with the field of subject of technological education. The requirement for an increased autonomy and responsibility for learning to the students themselves and the practical nature of technological education, involve active participation of students in determining the application of and preferred forms and tools for computer-assisted learning.

To study the degree of integration of ICT in Bulgarian junior high school technical education through the prism of students in 2014, we have conducted a questionnaire study with 223 students. A questionnaire of 11 questions has been composed and applied. It aims to obtain information about the purpose and methods of use of ICT in the process of technological education in the 5th to 8th grades. Opportunities for students to access computer and network resources at home and classes in 'Home Technology and Economy' and 'Technologies' and the focus of computer-aided learning tasks have been studied. The attitude of students towards some innovative computer-based learning methods and the opportunity for personalized learning have been explored. The questionnaire included questions with multiple choice and open answer. In some of the questions (4,5,6,8) possible answers are ranked in ascending order.

The study has been organized and carried out in three schools in different types of settlements - a town, a district town and a city. These are: 130 High School 'Stefan Karadzh' - Sofia City - 112 students interviewed; 'Ivan Vazov' High School - Blagoevgrad - 81 students interviewed, and Third Elementary School 'Hristo Botev' - Sandanski - 30 students interviewed.

3. RESULTS OBTAINED

The interviews of students showed a high degree of availability of computer resources and Internet access outside school. Processing of empirical data showed that only 2 of the respondents (0.90%) do not have access to computers at home. Most of the students own more than one electronic device



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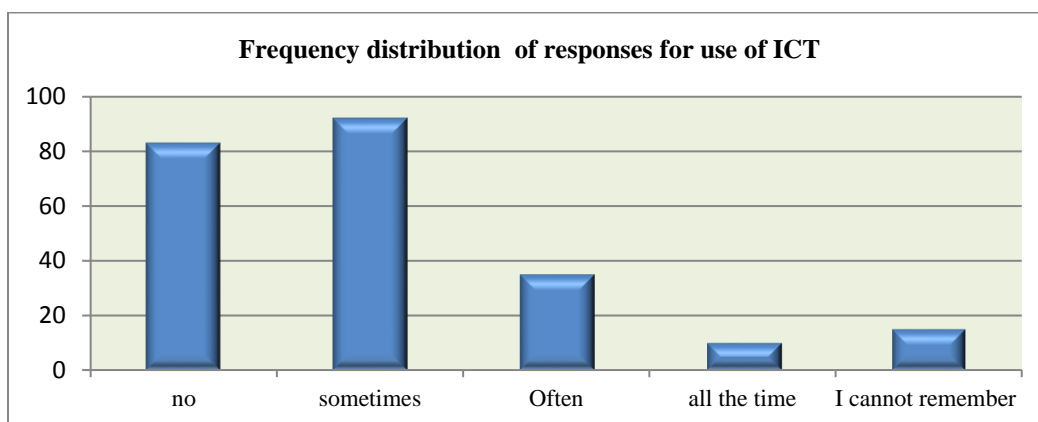
The results confirm that today's students live in an information saturated environment, and most of them have wide access to ICT outside school. The number of registered answers shows that 42.60% of students spend 2 to 4 hours a day to work on a computer. 39.46% spend less than two hours. Troublesome is the fact that 8.97% of the students use computers for more than 6 hours, and 6.28% from 4 to 6 hours.

Functional use of electronic devices owned by students at home has been examined by the answers to question №4 of the questionnaire. In the wording of the question a list is offered of information activities with ordinal assesment scale and an option of open answer. Arithmetic mean assesments calculated show that students often use computers and the Internet at home mostly for entertainment and communication - listening to music, playing computer games, watching movies and communication in social networks... Most of the students sometimes use computers for data processing for educational purposes - texts, photos, presentations. Similarly, to the same extent students use the Internet for implementation of project tasks, seeking information about homework assignments and preparation of lessons, communication with other students to collaborate on schoolwork. The value of trend, coinciding with the minimum assesment, shows that the majority of students do not have to communicate with teachers electronically. Digital technologies are used to study only sometimes. **Internet and mobile devices students use to have wide access to information used for various purposes, but to a lesser extent for education.**

To investigate the attitude of students towards the process of using ICT in school the data from questions №5 has been processed, a question designed specifically for that purpose. The data obtained show a clear positive attitude towards digitization of the educational process. The majority of respondents believe that ICT in the classroom are interesting and necessary (55%) and 18% - that they are indispensable. The share of those who like them, but believe they are not required is 25%. There are students who experienced difficulcy assesing (13%). Only 2% of the respondents disapprove of the use of new information technologies in the classroom.

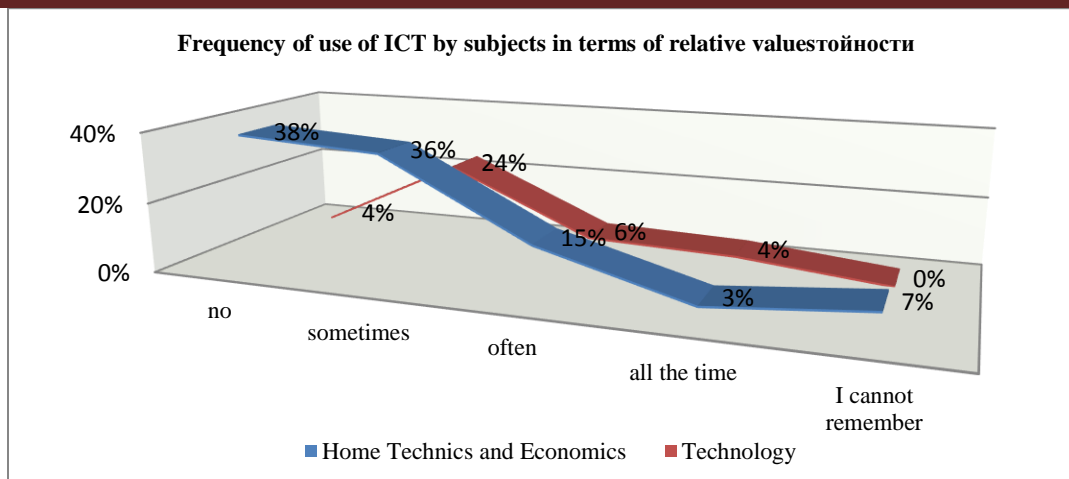
Findings of students on the use of computer technology in junior high school technical education have been obtained by the answers to questions 6 and 9 of the questionnaire.

Frequency distribution of answers registered to the question – ‘Are computers being used in your education on ‘Home Technology and Economy’ or ‘Technology?’ is shown in the figure below:



The measure of central tendency $\bar{X}=2.126$ and the value of the trend show that the dominant part of the students indicated that ICT is used in technological education sometimes. The relative share of this response is 41%. In twenty-seven percent of the respondents ICT are not used and 7% could not remember. Computer resources are often used in technological education according to 16% of students. Comparing the collected empirical data shows that the trend described in the evaluation was observed in the samples from all three schools involved in the study.

Comparing the degree of integration of ICT in individual subjects of the Classification of Fields of Education and Training of ‘Manner of Life and Technology’ is done in terms of relative values because the number of students interviewed from 7th and 8th grade is lower. The relative share is calculated according to the size of the sample. The results obtained are displayed in the following figure



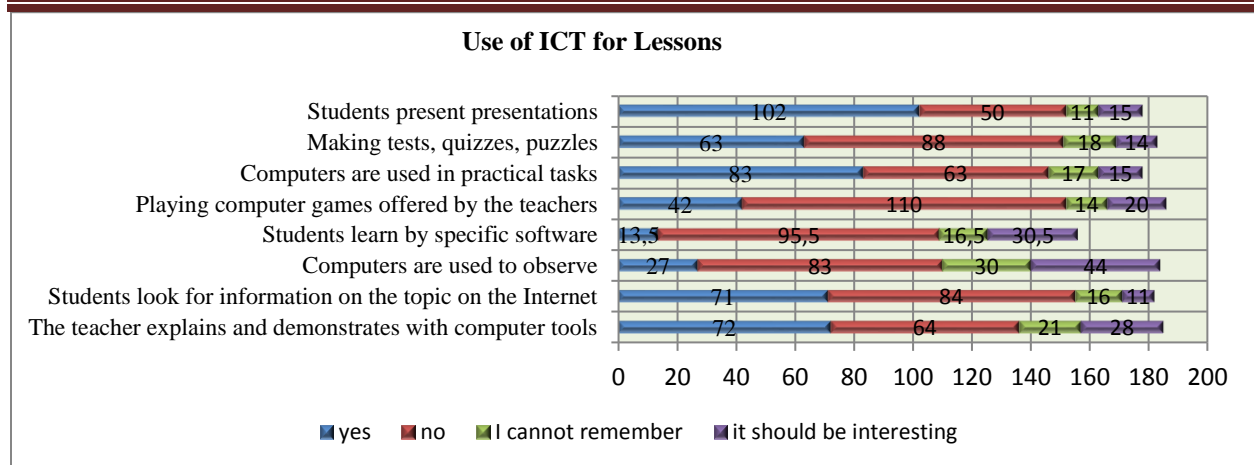
The graph shows that when teaching the Technologies subject, the relative share of non-use is low and this is quite naturally taking into account the fact that the educational content included an aggregated topic of ‘Computers and Communication Technologies’.

Open answers of students to the seventh question show that in schools participating in the study information and communication technologies are used in teaching many subjects. Most frequently the responses list the subjects of Information Technology, History, Bulgarian Language and Literature, People and Nature, Chemistry, Geography, Mathematics, etc. Apparently, resources availability and policy of school management at the three schools promote the use of ICT. In the registration forms there are several answers that ICT is only used for presentation, meaning that students expect a more diverse use of ICT.

The results for determination and differentiation of computer learning activities that engage students at home in the process of their preparation for Home Technology and Economy and Technologies show that most students are assigned homework assignments related to seeking additional information on studied topics, recording and editing texts, developing computer presentations and work on project tasks. The relative values of those confirmed performance of these informational activities is more than 50%. No tasks are assigned related to making electronic tests and quizzes (36%), individual work with digital Home Technology and Economy textbooks (48%), publishing works in Internet (46%), and electronic communication with teachers (39%). The relative share of students who cannot remember ranges from 6 to 14%. Naturally, engaging students with computer activities must be consistent with the large student workload and it cannot be of large number of tasks. The use of computers for learning and solving educational problems in the preparation process can diversify tasks, to motivate and enable students. It is an indicative fact that to the question if they were interested in the activities listed in the questionnaire, positive responses have been registered for all, although their relative values are relatively low from 7 to 21%. The biggest interest is manifested to work with educational discs specialized for technological education. This in turn raises the question of quality of electronic educational materials and access of students to them.

A determinant to characterize the process of integrating ICT in technological education are ways to use digital technology tools and products in the learning process in subjects of the Classification of Fields of Education and Training of ‘Manner of Life and Technology’. The opinion of students on this issue has been examined by question 9 of the research tools used. The structure of the question includes a variety of computer-based learning activities, and students determine the extent of use of these activities and whether they are of interest to them.

The statistics show that in classes of Home Technology and Economy and Technologies the computer lesson activities most frequently used by students are observing computer visualized explanations and demonstrations by the teacher, making and presenting computer presentations and practical tasks. The majority of respondents answered that the other computer lessons activities included in the questionnaire are hardly used in the learning process. From 6% to 17% is the relative share of students who cannot remember, and each variable of this value is different. The extend of use of ICT for learning is low. The distribution of answers registered to question №9 of the questionnaire can be seen on the figure below.



Empirical data show registered interest in all forms. The largest interest was shown in the use of computer tools to observe phenomena and processes, to learn with special software and computer explanations and demonstrations. Less preferred methods are looking for information on the Internet, making computer tests and creation and presentation of computer presentations. This finding shows that students want to use interactive teaching electronic means. It is expected that new textbooks and electronic textbooks being currently developed should meet the new educational standards for teaching the subject 'Technology and Entrepreneurship' corresponding to these educational needs.

The results of the study of individual students access to computer resources needed to implement the educational tasks in classes of Home Technology and Economy and Technologies show good hardware provision but probably relate to cases where for the purposes of technological training specialized computer labs are used. However, not always appropriate technological training is conducted in such an environment. Observations show that access of students to labs for technological training is very different. Therefore, 27% of respondents answered that they are not assigned tasks requiring the use of computers.

To the question of their Technologies teachers' confidence when working with ICT, large number of students - 49.30% indicated that they cannot say. Those who believe that teachers confidently use ICT in technological education are 36.62% and 12.68% say teachers are not confident when using ICT.

One of the innovative forms of e-learning is mobile learning where every student has access to personal portable computer devices (tablet, laptop, smartphone, phone). In the questionnaires used there is a question included to determine students' interest towards the use of mobile devices in class to solve educational problems and for learning. The collected empirical data show an increased interest - 73.54% of the students like the possibility described. The relative share of students who cannot say is 12.96%, only 9.87% do not like to use of mobile devices for educational purposes.

4. CONCLUSIONS

ICT is used in teaching subjects of the Classification of Fields of Education and Training of 'Manner of Life and Technology' (5th – 8th grade) but the degree of integration is low and corresponds to the initial levels - introduction and initial utilization of the integration process. The results of the questionnaire study convincingly show that students from the so-called Net generation who grew up in a technologically saturated environment, expect new information technologies to they can participate more intensively in class. They welcome the use of digital technology tools in the learning process and implementation of innovative pedagogies.

LITERATURE

- [1] Curriculum in Home Technics and Economics, Ministry of Education, Bulgaria
- [2] Curriculum in technologies, Ministry of Education, Bulgaria
- [3] ITEEA (International Technology and Engineering Educators Association) <https://www.iteea.org/>
- [4] Strategy for Effective Implementation of Information and Communication Technologies in Education and Science of the Republic of Bulgaria (2014-2020), <http://www.mon.bg/?go=page&pageId=74&subpageId=143>