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## Information technologies in teaching

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**Abstract.** With increasing knowledge and technological progress of society; our country requires learning skills that could help it keep pace with the development of science and technology. Educational systems in a community and consequently education will not be able to separate from other social institutions, national and international interactions widely known in the global village. But the fundamental problem is that what strategies should be adopted so that education systems in developing countries do not only follow developed countries but grow and progress base on their own needs in the path of progress. The paper discusses and explains the possibilities of using information technologies in which the students of the Academy of Technical - Art Professional Studies in Belgrade participated. The questionnaire contained four questions: students' opinion on the importance of ICT for learning and acquiring new knowledge; students' possession of ICT equipment; to what extent the Internet is used for teaching and learning purposes and time use of the device.

**Keywords:** Information technology, teaching, teacher, student, questionnaire.

### Introduction

Branson (2000) stated that students learn not only by the teacher but they also learn along with the teacher and by interacting with one another. Indeed, now students can learn much more than that the teacher teaches in conventional learning environments. For productive teaching learning process teachers and students have to use information technologies according to their requirements and availability. Skills in teamwork are highly relevant to preparing students for future work. Furthermore, interactive learning activities in teams, such as asking and answering questions, discussing tasks, and reviewing solutions, are known to improve students' understanding (Chen et al, 2021). However, collaborative and cooperative learning is challenging for students and teachers. The regulation of team learning activities imposes high levels of mental and emotional effort on students, who often lack the appropriate regulatory skills (Noro0zi et al,2020). Teamwork can also be more time consuming for students, as studies on pair programming indicate (Rosset al,1990). Students therefore need instructional support for team activities, especially if they are novices (Chen et al,2022). Teachers, on the other hand, often lack the appropriate competencies regarding the instructional design of collaborative and cooperative learning.

The path to quality application of group work in the teaching of informatics and computer science is difficult, but the persistence of practicing teachers and their enthusiasm can make this form accessible for several reasons: sociological reasons (Veldman and Klingenberg, 2009) - joint teaching activities bring students closer together, which is reflected in the improvement of interpersonal relationships between individuals, - more complete formation of beliefs, attitudes, aspirations and socially acceptable forms of behavior, - developing a sense and need for friendship, awareness that better results are achieved by working in pairs, which contributes to a more intensive social development of students, - abandoning egocentric attitudes and developing a sense of understanding the interlocutor; psychological reasons - more dynamic and freer communication, favorable working atmosphere and emotional balance, reduced tension due to possible failures, faster adaptation to teaching working conditions, - mental activation, practice in finding diverse and new ideas, their application and evaluation, - developing abilities and habits for cooperative and cooperative work in pairs contributes to the socialization of the personality; pedagogic reasons - Harmonizing the pace and way of working contributes to the education of socially acceptable characteristics, - the possibility of mutual monitoring,

comparison and evaluation of achievements, ways and rhythm of work, which has a motivating effect, - more effective learning; harmonizing and rationalizing the pace of learning, contributes to the training of students for self-education; didactic reasons – in a pair, each student can express himself more easily, and that contributes to the affirmation of his personality, than with collective (group, frontal, mass) work, - the pace of learning content can be adjusted to each partner, easier than with collective work, self-evaluation and mutual evaluation in a timely manner provides feedback and thus develops internal motivation, - it is easier to establish contacts with the teacher, - the student has an active, more subjective position in relation to the tasks performed, greater economy in relation to the use of time, energy, facilities, teaching aids and didactic materials ( see Leidner and Jarvenpaa,1995; McEuen, 2001 ;Laird and Kuh,2005; Pilkington,2008; Shatri, 2020).

### Analysis and Discussions

Implementing and practicing IT in classrooms help students improve their performance. Some teaching-related programs and Web designs have shown the ability to provide students with completely new learning contents. Teaching under the rules of the game provides students with higher quality learning. Challenging students' efforts when aiming for certain targets increases their motivations and drive. Students of the Academy of Technical - Art Professional Studies in Belgrade participated in the survey of this research: first-year students at the design department, second-year students at the management department and third-year students at the textile department for the purposes of the publication "Teaching aids in the teaching of informatics and computer science". Due to the incompleteness of the data in this text, we provide only partial results, which refer to "RESEARCH INTO THE USE OF ICT IN TEACHING". For the purposes of this research, the procedure applied by Bursać et al (\*\*\*) was used, as well as the many years of experience of the authors of these lines in conducting survey research (see Bulatović and Rajovic,2016; Rajović and Bulatović,2017 ; Bulatovi and Rajović, 2018; Bulatović et al, 2019; Bulatović and G. Rajović, 2022.The sample included 42 students at the Department of Design, Textiles and Textile Engineering in the 2021/22 school year. The questionnaire contained four questions: students' opinion on the importance of ICT for learning and acquiring new knowledge; students' possession of ICT equipment; to what extent the Internet is used for teaching and learning purposes and time use of the device.

From the answer to the first question, it is clearly seen that students in both environments have a clearly formed opinion about the importance of ICT for acquiring new knowledge and helping in learning. This is confirmed by the answers of students in Belgrade, 11 of them declared that they help a lot, outside Belgrade 22. It is interesting that we did not

receive a single answer - I don't know. Only three students in Belgrade and 6 students outside Belgrade responded to the small offer

**Table 1.** Students' opinion on the importance of ICT for learning and acquiring new knowledge (n=42)

| Belgrad |       |               | Outside the territory Belgrad |       |               |
|---------|-------|---------------|-------------------------------|-------|---------------|
| n = 14  |       |               | n = 28                        |       |               |
| A lot   | A bit | I do not know | A lot                         | A bit | I do not know |
| 11      | 3     | -             | 22                            | 6     | -             |

**Table 2.** Students' possession of ICT equipment (computer, tablet, mobile phone at home, n = 42)

| Belgrad |    |      | Outside the territory Belgrad |    |      |
|---------|----|------|-------------------------------|----|------|
| n = 14  |    |      | n = 28                        |    |      |
| C.      | T. | M.P. | C.                            | T. | M.P. |
| 14      | 12 | 14   | 26                            | 13 | 28   |

The possession of ICT devices is for our conditions of economic development and standards are at the highest level. It is noted that mobile telephony and owning a computer is dominant both in Belgrade and outside Belgrade. As for tablets, as many as 12 students in Belgrade declared that they own them, while 13 students answered yes outside Belgrade. These data clearly show us that generations are coming who were born in the digital age and who have a rich experience of using technology from everyday life. We must look at the teaching of informatics as an educational environment that encourages students to develop skills necessary for lifelong learning - developing logical thinking, developing procedural thinking, creativity, learning through trial and error, finding the necessary information to solve a problem and a critical attitude towards them. Informatics in the educational system has a universal role - it opens up the possibility of permanent education, contributes to social inclusion, overcoming the gap between the rich and the poor, between informal and formal, general and professional education

**Table 3.** To what extent the Internet is used for teaching and learning purposes (n = 42)

| Belgrad |           |            | Outside the territory Belgrad |           |            |
|---------|-----------|------------|-------------------------------|-----------|------------|
| n = 14  |           |            | n = 28                        |           |            |
| Enough  | Sometimes | Not at all | Enough                        | Sometimes | Not at all |
| 89 %    | 11 %      | -          | 78 %                          | 19%       | 3 %        |

Information and communication technologies were seen as a way to modernize education and bring it closer to the student, and the use of the Internet was recognized as an important aspect in order to improve the quality of teaching. The majority of respondents recognized the Internet as an important aspect of ICT use. Students in Belgrade use the Internet, 89% of those surveyed. It is noted that 11% of them sometimes use it for learning purposes. The survey shows that 78% of the total

number of surveyed students outside Belgrade use the Internet for study purposes, 19% of them sometimes, and 3% of students not at all. The respondents see its application in easier access and communication with friends through e-mail or social networks. When it comes to the application of ICT in the teaching of the Department of Design, Technology and Management - the Academy of

Technical - Art Professional Studies in Belgrade the statements of the students are different, the research shows that 74% of the students believe that even if there are computer cabinets in the department, they are not fully used. The students gave the following answers to the last question, which read: How much time do they spend per day using ICT devices.

**Table 4.** Time use of the device

| Question  | Belgrade   | Outside the territory<br>Belgrad                            |
|---|--|---|
| How many ICT devices do you use on average per day?<br>Phone,<br>Computer.... | Up to 1 hour – 3<br>Until 5 o'clock - 5<br>More than 5-6   | Until 1 o'clock-6<br>Until 5 o'clock - 19<br>More than 5-3  |
| Phone   | Until 2 o'clock -4<br>Until 5 o'clock - 5<br>More than 5-5 | Until 2 o'clock -9<br>Until 5 o'clock - 17<br>More than 5-2 |
| For what purposes do you use the device the most?                             | Social Networks - 5<br>Games - 2<br>Conversations - 7      | Social Networks - 5<br>Games - 4<br>Conversations -19       |

Table 4 clearly shows that the number of students who spend time on computers and phones is extremely large in Belgrade, up to 5 and more than 6 hours some of the ICT devices are used by a total of 11 students. For what purposes do they use the device the most, 7 of them responded to conversations, 5 students to social networks, and 2 students to games. Outside of Belgrade, a total of 22 students uses the phone for up to 5 or more hours, and 5 of them use social networks, and a total of 19 students use it to talk. Students stated that they have access to computers outside of school as well, mostly at home 95.7%, then with relatives and friends 2.3%, slightly less in Internet cafes 1.9%, and a small number of students do not have access to a computer outside of school 0, 1%. The growth of the Internet in the world provides many opportunities to many people around the world in many different ways. When students are considered, the use of the Internet is mainly for social and entertainment purposes. However, it is very obvious that the Internet provides not only social connection and entertainment, but also academic and scientific information as well. Additionally, the Internet can be used as a tool to learn the latest news all around the world as well as getting any kind of information that serves different purposes such as learning more information about a hobby or health. Therefore, it can be said that the Internet is the source of spreading information quickly to a large audience and of going beyond the limitation of time and space. In the light of the above information, it is vitally important to encourage students to use this invaluable source to get any kind of information they need in their academic studies (Dogear et al, 2011).

### Instead of Conclusion

Information technology is an enormously vibrant field that emerged at the end of the last century as our society experienced a fundamental

change from traditional society to an “information society.” Using Information Technologies learners are now able to participate in learning communities throughout the world. They are independent and free in choice of their programs of study and access to the resources. They can learn collaboratively, share information, exchange their learning experiences and work through cooperative activities in virtual learning communities. Similarly, the role of teacher is also different in new settings from in the conventional system. Teacher facilitates and guides the learners in their study playing the role of a coach or mentor. Now teacher is not at the center of the instruction and sole source of information as in conventional classrooms. He/she decides contents/experiences and/or activities, locates the resources and guides learners how to have access and utilize the information for required outcomes. According to Borysiuk (2013) in his article “Benefits and disadvantages of the use of information technologies in education”, the benefits of using the information technologies are: 1) increased interest in and overall motivation for education; 2) individualization of education; 3) objectivity of control; 4) activation of education through the use of attractive and rapidly changing forms of information presentation; 5) formation abilities and skills for the creative activities; 6) training of information culture; 7) mastering the skills of operational decision-making in a complex situation; 8) students' access to databases of information that enable them to quickly obtain information; 9) intensification of self-student work; 10) increase in the volume of completed tasks; 11) increased motivation and cognitive activity due to the diversity of exercises, including the possibility of game time; 12) enhanced of information flow; 13) online education offer new opportunities for more active involvement of students in the educational process. Also, in his article Borysiuk (2013) states that the advantages of using information technology are: 1) it

creates a more interactive experience; 2) it provides unlimited resources; 3) it helps build necessary skills for the future; 4) it saves precious resources; 5) it instantly updates information; and 6) it does not take up much space. With increasing knowledge and technological progress of society; our country requires learning skills that could help it keep pace with the development of science and technology. Educational systems in a community and consequently education will not be able to separate from other social institutions, national and international interactions widely known in the global village. But the fundamental problem is that what strategies should be adopted so that education systems in developing countries do not only follow developed countries but grow and progress base on their own needs in the path of progress [see Hamidi et al,2011). At the end, Bursać et al (\*\*\*) conclude that the goal of the teaching subject Computer science and informatics should be present in all teachers, which is to enable students to acquire knowledge, master skills and form values that contribute to the development of information literacy necessary for further education, life and work in modern society, as well as training students to efficiently and rationally use computers in a way that does not endanger their physical and mental health. Teachers should highlight and inform students about the ergonomic problems of working with computers and other ICT equipment.

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