

# Students' attitudes towards computers and internet - everyday use and possibility of use in geography teaching

Olja Maričić<sup>1</sup> , Anđelija Ivkov-Džigurski<sup>2</sup> , Ivan Stojšić , Ljubica Ivanović Bibić<sup>2</sup> 

<sup>1</sup> University of Novi Sad, Faculty of Education in Sombor, Sombor, Republic of Serbia

<sup>2</sup> University of Novi Sad, Faculty of Sciences, Department of Geography, Tourism and Hotel Management, Novi Sad, Republic of Serbia

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Internet in teaching.

## Abstract

Beginning with the fact that education needs to be oriented towards students and their interests and bearing in mind that today's children get in touch with computers since their earliest childhood, contemporary education needs to recognize the necessity of including them in the teaching process. This work represents a research conducted with the aim of examining the students' attitudes of advantages of using computers and Internet in Geography teaching, as well as determining the extent of their use in Geography teaching in elementary schools. The data were collected using questionnaire constructed for the requirements of this research and the sample covered 273 students of final grades in 7 elementary schools in Vojvodina (The Republic of Serbia). The results showed that computers and Internet are very rarely used in Geography teaching and that this aspect of modernizing the education still has not found its place in the teaching process despite its numerous advantages.

## 1. Introduction

The education in every organized society, since ancient times until today, had a significant role-its quality influenced and shaped the society to a great extent. The necessity of lifelong learning has been pointed out in the last decades, as well as the fact that that it is extremely important to teach the new generations how to learn, how to reach new findings and how to apply the acquired knowledge. The desired capabilities and functional (applicable) knowledge that we wish to develop in students are achieved by continual improvement and modernization of teaching.

The use of computers in education is steadily (Tondeur et al., 2007). As the traditional teaching model is not capable of fulfilling the growing needs of the modern society (Akhtar et al., 2015) it is necessary for the education to keep pace with newborn demands. Milutinović (2008) emphasizes the neces-

sity of such transformation and a greater flexibility of education in order not to fall behind the social and technological development. The author deems that the original purpose of the traditional school is outdated and therefore it is necessary to develop the capability of learning, developing mutual relations and decision making in new generations.

The so called Internet generation of students, that is the children and youth born between 1994 and today, which are characterized by a positive attitude toward technology, experience learning in various manners and do not deem the teachers as the primary sources of information (Golijanin et al., 2014). Therefore, a modern organized education, besides having various forms of teaching, implies the introduction of computers and Internet in realization of such contents where it provides a better outcome that the traditional teaching methods do. The need for an education organized in such a manner originates from everyday life of modern people who have been oriented toward their use and have

relied on them since their early days because they facilitate their everyday activities.

Ivkov-Džigurski and associates stated the data that in 2000 between 60 and 70% of the population in the leading countries of the world used electronic equipment and that the countries of the Western Europe, USA and Japan took the leading positions in use of electronic and other modern school equipment (Ivkov-Džigurski *et al.*, 2009). On the other hand, the conjoined studies by the OECD showed that at the end of the last century member countries were divided in two groups when it comes to using computers in education. The first group was the countries, Serbia being a part of them, which introduced IT and computers in its education. The second group were those countries that, besides introducing IT and computers in their education, introduced education using computers in all other levels of education, with the aim to improve the teaching and learning processes. This second conception of informatization of education is accepted today as a tendency for the future of education modernization (Jokić, 2010).

## 2. The Possibility of using Computers and Internet in Geography Teaching

The subject of Geography offers numerous opportunities for using computers and Internet in teaching, but there are various reasons why they are being insufficiently used. Some of the most frequent reasons are insufficient equipment, lack of space, untrained teachers, preparation time, etc. (Bednarz & Van der Schee, 2006).

Savić (2002) emphasized that the implementation of computers into teaching to a greatest extent depends on the informational literacy of the teachers. This problem, which still greatly influences the domination of traditional teaching and limits the use of computers in the teaching process, is overcome with education and training (formal education, specialized courses and seminars), but also by familiarizing with new tendencies and achievements in the world of informatics. Today, a great number of blogs useful for exchange of materials among the teachers can be found on the Internet, which can be of significance to those teachers who do not feel skilled enough to create the programs themselves. Finished presentations, software, movies, clips or animations applicable in classes can be found on these blogs. It is not rare that the teachers deem that by using computers and Internet their role in the teaching process is lessened or completely diminished. In fact, their role is only changed since it remains dominant during the preparatory phase while during the acquirement phase the role of the students

and their activity is emphasized – the greater involvement increases student's efficiency and it contributes to a more positive attitude toward learning (Underwood, 2009). Another one of the most frequently mentioned downsides is that learning using computers does not achieve the highest quality form of learning since it represents a so called "guided learning" (with programmed and semi programmed teaching the student receives certain directions based on which she or he solves actual problems). This is the reason why computers and Internet should be combined with special forms of teaching (for example, problem, research and project one) where their use will help solve certain problems.

A great advantage of using computers is reflected in activation of students who become involved in the teaching process and at the same time develop their independence (Underwood, 2009). Ivkov-Džigurski and associates (2009) deemed that the interactive form of learning using computers is far more efficient since it enables a maximal involvement of the students in the teaching process and therefore improves the learning effect along with increasing the students' interest. Internet and computers that are applied in the teaching process contribute to the improvement of cooperation between the students within a class and their engagement in the process of knowledge acquirement.

Engagement of students by using computers and Internet in teaching appreciates individual differences between them and respects their personal abilities resulting in the fact that each student progresses in his or her pace (Mijanović, 2005). At the same time, the use of computers achieves individualization of teaching and enables overcoming of certain psychophysical limitations of students (visual and hearing impairment, etc.) and their equal participation in the teaching process (Imširagić & Delić, 2014; Furlong *et al.*, 2017). The advantage of using computers in teaching is their applicability in all types of classes – the process of knowledge acquirement, as well as systematization and evaluation – organizing various quizzes, electronic tests, using games with geographic content and similar (Reimer & Schrader, 2015).

The computers and Internet in Geography classes can be used in various manners: for information and data searches (whether they are being searched in classes or through individual research activities of the students), using presentations that need to be enriched by photographs and audiovisual materials besides text, using certain computer software, games with geographic content, watching documentary and popular science films, using Google Earth, Google Maps and other programs, etc., which would help achievement of the

principles of evidence and interest in Geography teaching. Numerous internet pages offer various games applicable to the teaching process. The teachers, and even the students, can create their own games and quizzes with a geographic content in a simple way (for example using Webquesting, Kahoot or Hot potatoes programs) that they can use in class or at home for learning.

The results of the recent researches that dealt with the application of computers in learning (Bayturan & Kesan, 2012; Serin, 2011; Cheng, Cheng, & Chen, 2012; Hancer & Tuzemen, 2008; Tech & Fraser, 1994) showed significant positive effects and a high degree of achievement with students that were taught using computers compared to those that were taught using traditional methods. This results contribute to the fact that computer aided teaching modernizes the teaching process, motivates the students and contributes to their activation and better acquirement of knowledge. Certain empirical researches (Healey et al. 1996; Osodo et al., 2010; Bowlick et al., 2016; Samkange, 2016; Luo et al., 2016; Sharma, 2017; Kidman, 2018) showed the efficiency of using computers in teaching for easier and faster acquirement of knowledge and its persistence, which correlates with the statement from Mayer (2003) that learning using computers and multimedia (pictures, animations and words) enables the students to understand the content easier and firmer. Technology in education will increase students attention and interest, provide visual learning and contribute to permanent learning (Artvinli, 2017). According to Lambert & Cuper (2008) today's intelligence is not defined by the quantity of knowledge but the capacity of the individual to create, produce and apply technologies in complex life situations. The authors deem that these skills represent the core goals of education of the modern generations of students. The results of the research conducted by Davies and Cormican (2013) indicate that among various forms of multimedia materials applicable in teaching (presentational slides, video, online course books and interactive webpages) the computer materials proved to be most efficient. The applications of computers in teaching turned out to be the most popular and efficient learning method among the students. Hermans and associates (Hermans et al., 2008) referred to a statement by Brown and associates (Brown et al., 1994) that the computers are a cognitive means of high potential for teaching and constructivist learning and in accordance with that they conducted a research whose results confirmed a positive effect on constructivist learning achievable by applying the computers in teaching. The research by Cheng and associates (Cheng et al., 2012) that deals with better scores achieved in

a group on which a multimedia teaching using computers was applied compared to the group that was taught using traditional methods also supports the claim that the application of computers in teaching achieves positive effects.

### 3. Research Methodology

The problem of this research can be formulated through the question to what extent the computers and the Internet are used in practical work as the means of improving and modernizing Geography teaching process and what are the observed positive sides of using digital technology in teaching from the students' perspective?

The aim of the research is the examination of use of computers and Internet in Geography teaching, as well as students' acknowledgement of the advantage of using computers and the Internet, with the final purpose of showing the necessity of innovation of the teaching process using modern digital technologies – using computers and Internet, which are still rarely used in practice even though numerous researches proved that they abet the efficiency of teaching and the very process of knowledge acquirement (Hancer et al., 1994; Tuzemen, 2008; Serin, 2011; Bayturan & Kesan, 2012; Cheng et al., 2012).

In accordance with the defined aim of the research, the following tasks were separated: research to what extent the computers are used in everyday activities of the surveyed students; determine how long the students have been using the computers and Internet, as well as the purpose why they most frequently use them; research whether Geography teaching is modernized by the use of computers and Internet; determine the contents where the digital technology is used in the teaching process; determine whether a statistically significant difference exists in the answers of students regarding the use of computers and Internet in Geography teaching if they are observed in relation to the environment they are being educated in.

In accordance with the aim of the research and based on the results of the previous studies and experiences from practice, the following hypotheses were defined:

H1: The majority of the students own computers that they use on a daily basis;

H2: Computers, as well as Internet, are most frequently used for fun and communication, rarely for educational needs;

H3: Computers and Internet are rarely or almost never used in Geography classes;

H4: There are no statistically significant differences in answers of the students from city and country schools.

The first hypothesis is based on the assumption that the majority of the students own a computer at home and uses it very frequently (some of them even on a daily basis) and that they, as the majority of the younger generations, have been using them for years. The second hypothesis is based on a claim that computers and Internet are used most frequently in their spare time, on social networks, listening to music and watching movies. The assumption is they are weakly motivated for individual research at home and finding certain information that are related to the content covered in Geography classes. The third hypothesis evolves from the authors' assumption that, besides numerous effects that are achieved by using modern forms of teaching, traditional teaching method still dominates in Geography teaching, most frequently done using frontal teaching method.

An instrument constructed for the needs of this research was used and it consisted of a combination of a scale and a 17 closed questions questionnaire. The questions within this instrument were grouped in three parts. The first part contained questions related to the interest of students related to Geography. The second part were the questions related to use of computers and Internet by the students at home. The third part was related to use of computers and Internet in Geography classes. The students circled one of the answers offered and in certain questions circled the answer represented in 1-5 Likert type scale (1 - completely disagree, 2 - partially disagree, 3 - indecisive, 4 - agree, 5 - fully agree). The questionnaire was anonymous and done in classes during 2016/2017 school year.

273 students of final grades of seven elementary schools in Vojvodina (The Republic of Serbia) participated in the research, 173 (63.4%) attending city schools while 100 (36.6%) students attended country schools. Looking at the gender structure, the sample was quite balanced - 53.1% were boys and 46.9% girls.

SPSS 19.0 program was used for processing of the received data and the following statistical procedures were applied:

the measures of descriptive statistics, bivariate correlation analysis and t-test.

#### 4. Research Results

To a question whether Geography is an interesting subject, the majority of students answered affirmatively (graph 1). Out of 78% of students who love Geography, 27% loves it due to its interesting content, 31% deems the matter not hard to comprehend while 42% of students loves Geography exactly due to the interesting manner it is presented by the teacher. On the other hand, 22% of students do not see Geography as an interesting subject out of several reasons: 51% of them deems the content uninteresting, 18% deems is too rumbly, 8% deems the teacher as too demanding while 23% of Geography students does not like the subject exactly due to the manner it is presented by the teacher.

The largest percentage of researched students have been using computers for more than five years, a slightly lower percentage between one and five years while the number of those who have been using it only for a year was expectedly low. Such results tell us that the greatest number of researched students have been using computers since so-called class teaching (grades I-IV), which indicates a high level of computer literacy among children today, which is being developed more and more early. The majority of the students (69.6%) answered that they use a computer every day, a slightly lower number (20.5%) uses it occasionally and (7.3%) rarely. An interesting data is that only one student said that he never uses a computer. The obtained results show a high representation of computer use in everyday life, which is rising year after year.

As expected, the majority of students answered affirmatively to the question of using Internet at home (Figure 3) - 95% of students use it.

This leads to a conclusion that there is no difference when it comes to Internet use in the city and in the country. It is present in both environments and a high percentage of researched students have access to it and use it. Based on the

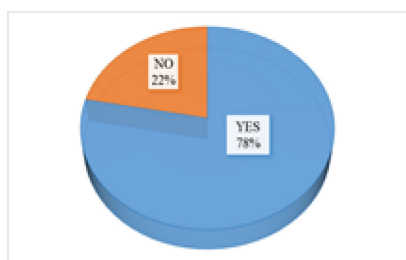


Figure 1. Students' attitudes about the subject.

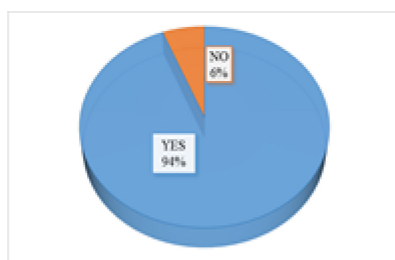


Figure 2. Students who have and don't have a computer.

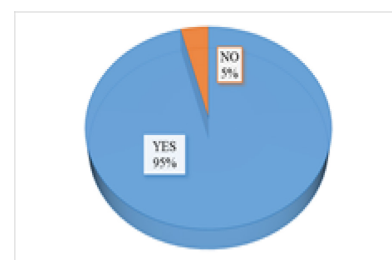


Figure 3. Use of the Internet at home.

obtained results it can be stated that the first hypothesis was confirmed.

Trying to determine the accuracy of the second hypothesis the arithmetic mean of the value of students' answers on the use of computers was calculated first, and then that related to the use of Internet. Based on the results in Table 1 it is evident that "listening to music", "watching movies" and "playing games" have the highest average mean. Although the average means of other answers are not significantly lower, it is evident that the computers are more often used for fun than for performing school tasks and activities.

Just as it was shown in the previous table, in Table 2 the highest average means occur with answer "listening to music", with a difference that the Internet is to a greatest extent used as a means of communication (Email, Viber, Skype, Messenger...) or for social networks (Facebook, Twitter). A slight difference also exists with average means for other answers, but what is specific is that the Internet is to a certain extent used more frequently for school tasks. This claim can be explained by the fact that today's younger generations are more prone to search for certain data on the Internet because they find the answers incomparably faster than looking for them in books. A teacher is obliged to warn them that today it is easy for everyone to create and maintain Internet pages, therefore they should develop a critical view of certain information and teach them to consult various literatures and not take the obtained data for granted.

Pearson correlation was used to examine whether there was a statistically significant link between students' habits of using computers and Internet for fun and school activities.

**Table 1.** The purpose of computer use.

| You use the computer for:                              | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | AS   | SD   |
|--|-------|-------|-------|-------|-------|------|------|
| Watching movies  | 3.7   | 7.7   | 18.3  | 27.5  | 34.1  | 3.37 | 1.57 |
| Listening to music                                     | 4.0   | 2.6   | 8.4   | 15.4  | 63.0  | 4.40 | 1.05 |
| Photography storage and editing                        | 16.8  | 19.0  | 17.9  | 19.0  | 16.8  | 3.00 | 1.39 |
| Playing games  | 19.8  | 11.4  | 13.2  | 15.4  | 35.5  | 3.37 | 1.57 |
| Students' works related to school activities and tasks | 21.2  | 22.3  | 23.1  | 14.3  | 8.4   | 2.62 | 1.27 |

**Table 2.** The purpose of Internet use.

| Internet is used for:   | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | AS   | SD   |
|---|-------|-------|-------|-------|-------|------|------|
| Watching movies   | 4.7   | 7.9   | 16.9  | 29.1  | 41.3  | 3.94 | 1.15 |
| Listening to music  | 3.6   | 3.2   | 7.5   | 13.5  | 72.2  | 4.48 | 1.01 |
| Editing, uploading and sharing of photographs and recordings (Instagram, Flickr...) | 20.1  | 20.1  | 14.3  | 18.0  | 27.5  | 3.13 | 1.51 |
| Playing games   | 24.9  | 14.2  | 11.9  | 17.4  | 31.6  | 3.17 | 1.60 |
| Social networks   | 8.9   | 4.3   | 4.3   | 17.4  | 65.1  | 4.26 | 1.27 |
|   | 5.6   | 6.0   | 11.7  | 22.6  | 54.0  | 4.13 | 1.18 |

The sustainability of the second hypothesis was checked using bivariate Pearson correlation analysis. Significant positive correlations indicate that the students who use computers and Internet for fun at the same time use them for education. Significant correlations were identified with answers "computer is used for watching movies" and "computer is used to make presentations" (the correlation is of low intensity since  $r = 0.262, p = .00$ ), then with answers "computer is used for photography storage and editing" and "computer is used for typing texts" (the correlation is of medium intensity since  $r = 0.455, p = .00$ ), "computer is used for photography storage and editing" and "computer is used to make presentations" (the correlation is of medium intensity,  $r = 0.353, p = .00$ ). Low intensity correlation was identified with answers "computer is used for photography storage and editing" and "Internet is used for searching and gathering data for school" ( $r = 0.271, p = .00$ ). With answers "Internet is used for communication" and "computer is used for students' works related to school activities and tasks", a low intensity correlation was identified, too ( $r = 0.287, p = .00$ ). Based on the results obtained, the second hypothesis was partially accepted.

Half of the students covered in this research answered that in their school the Internet cannot be used in classes (Graph 4). The question is whether it is truly impossible or it is being so rarely used that the students do not really know it was possible.

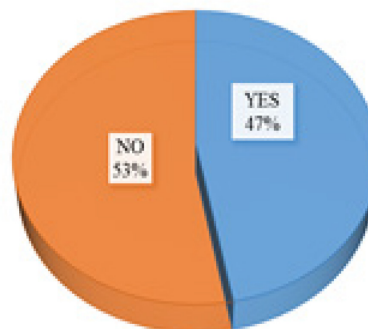


Figure 4. The possibility of using the Internet in teaching.

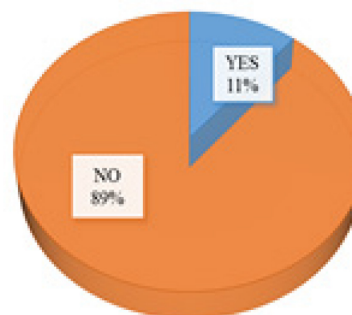


Figure 5. The possibility of using the Internet in a geography classroom.

The results shown in Table 3 represent a low arithmetic mean for all individually offered answers.

As expected, the largest number of students answered “completely disagree” to the question related to using Internet for certain content from Geography classes, which confirms the initially defined hypothesis that computers and Internet are rarely or almost not at all used in Geography classes.

A high percentage of students were unable to estimate the positive effects they would have if learning with the help of computers was used in Geography classes or if it was aided by Internet use. Based on the results presented in Table 3, 4 and 5 it is concluded that computers and Internet are rarely or almost not at all used in Geography classes, which confirms the third hypothesis of the research.

By comparing two different populations (students from the city and country environment) it was examined whether there were statistically significant differences between their answers (Table 5).

The arithmetic means for all the answers (no matter in which environment the school is located) are very low, although the answers of the students from the city for each statement are higher. Computers are rarely or almost never used in teaching, but the results from Table 5 indicate the fact that their use is still somewhat higher in urban schools.

**Table 3.** The contents the Internet was used for in Geography classes.

| Internet in Geography classes is used for                         | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | AS   | SD   |
|---|-------|-------|-------|-------|-------|------|------|
| Studying contents from Physical Geography                         | 80.3  | 6.4   | 6.9   | 2.8   | 3.7   | 1.43 | 1.00 |
| Studying contents from Social Geography                           | 76.2  | 3.3   | 7.5   | 7.9   | 5.1   | 1.63 | 1.22 |
| Getting to know the sites of the countries that are being studied | 69.3  | 8.7   | 6.9   | 6.9   | 8.3   | 1.76 | 1.32 |
| Testing knowledge using games with geographic content             | 82.1  | 4.6   | 6.0   | 2.3   | 5.0   | 1.44 | 1.06 |

**Table 4.** Effects estimate using Internet.

| Internet in Geography classes helped me to:  | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | AS   | SD   |
|--|-------|-------|-------|-------|-------|------|------|
| Comprehend certain notions and processes easier                                    | 68.8  | 9.5   | 7.2   | 5.4   | 9.0   | 1.76 | 1.32 |
| Find necessary information faster than going through textbooks and encyclopedias   | 65.6  | 5.0   | 12.4  | 5.0   | 11.9  | 1.93 | 1.43 |
| Did not help   | 70.2  | 7.0   | 4.7   | 4.7   | 13.5  | 1.84 | 1.46 |
| We did not use Internet in classes but I think it would help me acquire the matter | 54.8  | 4.8   | 7.5   | 11.0  | 21.9  | 2.40 | 1.70 |

An analysis of the t-test of independent samples was performed, on the basis of which it is concluded that students in the city give statistically significantly more affirmative answers compared to students from rural areas, based on which the fourth research hypothesis is rejected.

**Table 5.** T-test analysis of independent samples to compare the answers of students from different environments

|  |         | N   | AS   | SD   | Difference AS | t      | p     |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|--|---------|-----|------|------|---------------|--------|-------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|---------|----|------|------|--|------|-----|------|------|-------|--------|-------|
| Is it possible to use Internet in classes in your school?                          | City    | 170 | 0.41 | 0.49 | -0.20         | -3.218 | 0.001 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 99  | 0.61 | 0.49 |               |        |       | Is it possible to use Internet in Geography classroom?                             | City | 171 | 0.05 | 0.22 | -0.12 | -3.280 | 0.001 | Country | 98 | 0.17 | 0.38 | How often is Internet used in Geography classes?                                   | City | 171 | 0.13 | 0.47 | -0.74 | -8.406 | 0.000 | Country | 98 | 0.87 | 0.97 | Studying contents from Physical Geography  | City | 145 | 1.19 | 0.67 | -0.71 | -5.270 | 0.000 | Country | 73 | 1.90 | 1.32 | Studying contents from Social Geography  | City | 145 | 1.30 | 0.83 | -0.97 | -6.347 | 0.000 | Country | 69 | 2.28 | 1.40 | Getting to know the sites of the countries that are being studied                  | City | 146 | 1.40 | 1.00 | -1.10 | -6.321 | 0.000 | Country | 72 | 2.50 | 1.56 | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 |
| Is it possible to use Internet in Geography classroom?                             | City    | 171 | 0.05 | 0.22 | -0.12         | -3.280 | 0.001 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 98  | 0.17 | 0.38 |               |        |       | How often is Internet used in Geography classes?                                   | City | 171 | 0.13 | 0.47 | -0.74 | -8.406 | 0.000 | Country | 98 | 0.87 | 0.97 | Studying contents from Physical Geography  | City | 145 | 1.19 | 0.67 | -0.71 | -5.270 | 0.000 | Country | 73 | 1.90 | 1.32 | Studying contents from Social Geography  | City | 145 | 1.30 | 0.83 | -0.97 | -6.347 | 0.000 | Country | 69 | 2.28 | 1.40 | Getting to know the sites of the countries that are being studied                  | City | 146 | 1.40 | 1.00 | -1.10 | -6.321 | 0.000 | Country | 72 | 2.50 | 1.56 | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |
| How often is Internet used in Geography classes?                                   | City    | 171 | 0.13 | 0.47 | -0.74         | -8.406 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 98  | 0.87 | 0.97 |               |        |       | Studying contents from Physical Geography  | City | 145 | 1.19 | 0.67 | -0.71 | -5.270 | 0.000 | Country | 73 | 1.90 | 1.32 | Studying contents from Social Geography  | City | 145 | 1.30 | 0.83 | -0.97 | -6.347 | 0.000 | Country | 69 | 2.28 | 1.40 | Getting to know the sites of the countries that are being studied                  | City | 146 | 1.40 | 1.00 | -1.10 | -6.321 | 0.000 | Country | 72 | 2.50 | 1.56 | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Studying contents from Physical Geography  | City    | 145 | 1.19 | 0.67 | -0.71         | -5.270 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 73  | 1.90 | 1.32 |               |        |       | Studying contents from Social Geography  | City | 145 | 1.30 | 0.83 | -0.97 | -6.347 | 0.000 | Country | 69 | 2.28 | 1.40 | Getting to know the sites of the countries that are being studied                  | City | 146 | 1.40 | 1.00 | -1.10 | -6.321 | 0.000 | Country | 72 | 2.50 | 1.56 | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Studying contents from Social Geography  | City    | 145 | 1.30 | 0.83 | -0.97         | -6.347 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 69  | 2.28 | 1.40 |               |        |       | Getting to know the sites of the countries that are being studied                  | City | 146 | 1.40 | 1.00 | -1.10 | -6.321 | 0.000 | Country | 72 | 2.50 | 1.56 | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Getting to know the sites of the countries that are being studied                  | City    | 146 | 1.40 | 1.00 | -1.10         | -6.321 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 72  | 2.50 | 1.56 |               |        |       | Testing knowledge using games with geographic content                              | City | 146 | 1.20 | 0.76 | -0.72 | -4.978 | 0.000 | Country | 72 | 1.92 | 1.37 | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Testing knowledge using games with geographic content                              | City    | 146 | 1.20 | 0.76 | -0.72         | -4.978 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 72  | 1.92 | 1.37 |               |        |       | Comprehend certain notions and processes easier                                    | City | 149 | 1.44 | 1.10 | -1.01 | -5.684 | 0.000 | Country | 72 | 2.44 | 1.48 | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Comprehend certain notions and processes easier                                    | City    | 149 | 1.44 | 1.10 | -1.01         | -5.684 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 72  | 2.44 | 1.48 |               |        |       | Find necessary information faster than going through textbooks and encyclopedias   | City | 147 | 1.52 | 1.11 | -1.26 | -6.639 | 0.000 | Country | 71 | 2.77 | 1.66 | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Find necessary information faster than going through textbooks and encyclopedias   | City    | 147 | 1.52 | 1.11 | -1.26         | -6.639 | 0.000 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 71  | 2.77 | 1.66 |               |        |       | Did not help   | City | 146 | 1.66 | 1.39 | -0.57 | -2.732 | 0.007 | Country | 69 | 2.23 | 1.54 | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| Did not help   | City    | 146 | 1.66 | 1.39 | -0.57         | -2.732 | 0.007 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 69  | 2.23 | 1.54 |               |        |       | We did not use Internet in classes but I think it would help me acquire the matter | City | 152 | 2.16 | 1.67 | -0.72 | -3.060 | 0.002 | Country | 76 | 2.88 | 1.66 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
| We did not use Internet in classes but I think it would help me acquire the matter | City    | 152 | 2.16 | 1.67 | -0.72         | -3.060 | 0.002 |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |
|  | Country | 76  | 2.88 | 1.66 |               |        |       |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |         |    |      |      |  |      |     |      |      |       |        |       |

## 5. Discussion

The goal of the conducted research was examining the frequency of computer and Internet use in Geography teaching, as well as students' understanding of the advantages of their use. The results of the research presented in this paper confirmed the initial hypothesis, derived from the findings of the previous study (Žumárová, 2015), that the majority of the students owns a computer and uses it on a daily basis. This finding indicates the possibility of the implementation of the positive aspects of using digital technologies in education and students' individual work. Fulfilling this important precondition for computer use by the students opens the possibilities of wide application of digital technologies by the students not only for fun and leisure purposes at home but for learning, homework, knowledge and students' interest expanding, as well, which is crucial for development and improvement of their individual competences and their preparation for an active participation in a modern informatics society.

The assumption that the researched students most frequently used the computers at home for fun and communication was not fully accepted since their individual answers indicate the use of computer and Internet in spare time but also for performing certain school tasks. Also, a positive connection between the use of computers for fun and educative purposes was established. Such finding encourages and gives hope that there is a certain potential in students in terms of using computers and Internet for educative purposes and performance of learning activities and tasks. The teachers should particularly encourage and point to the use of computers at home with the aim of fulfilling different educative goals of the teaching process – from performing actual tasks using digital technologies to developing various students interests and abilities, all through encouraging the educative use of computers at home. This can often be a combination of learning and fun using quizzes and games, where students' competences are extended and improved in a manner that is fun and appropriate to their age and interests (Prensky, 2001; Chee, 2014; Riemer & Schrader, 2015).

It is particularly significant that this research showed that computers and Internet in the teaching process, namely in Geography classes, are being used rather rarely, with a slightly higher frequency of use in city schools. This data is very worrying, bearing in mind the obvious advantages of computer use in teaching, particularly when it comes to Geography where the students would have a more interesting

and dynamic lectures and at the same time easier comprehension of the Geography subjects if the contents were presented and even examined digitally using computers and digital technologies. This way students' attention and interests in the teaching content are activated and intensified, especially taking into account the fact that the use of digital technologies is in itself dynamic and familiar to students.

Geography teaching offers numerous possibilities for use of digital means and it showed that exactly due to them not being used the students are not even aware of their advantages and possibilities, even though they not rarely estimated that the actual teaching manner, including the contents themselves, most probably exactly due to this reason, are not particularly interesting. This is what the teachers should be aware of and when it comes to choosing the teaching means they should be guided by the research results that show the significance of using digital technologies in Geography teaching. Also, as the results of this research showed, it is particularly important to encourage the use of computers in small and country environments, where the positive aspects of digital means and computer use in classes seem particularly neglected.

Even though all the schools covered by this research were equipped with computers and had a computer classroom, the great majority of them did not have internet connection in the classrooms and the teachers were not enabled to directly use the Internet in classrooms. Provided classroom internet connection would significantly ease the teaching process, whether the materials prepared in advance or Internet data search prompted by the students' in class questions were the matter, making this one of the recommendations derived from this research.

## 6. Conclusions

Today's generations of students use computers and Internet most frequently in their spare time, for fun and communication. They are very significant and have an important role; therefore they should be more often used in the teaching process as well, especially in Geography classes, but also connected to extracurricular activities. This way the teachers would, besides modernizing their teaching, increase the level of students' engagement and motivation, at the same time undoubtedly securing certain success in the process of knowledge acquirement.

The introduction of computers into the teaching process needs to be coordinated with the contents that are being covered and must not be the aim per se. It is necessary to combine it with other teaching and work methods in order



for the teaching process to reach its fullest effect. The thing that has a great influence on the quality of knowledge the students will have after the teaching content was realized is the quality of the program (educational software) that was used. Therefore, this aspect needs to be taken into account, as well.

Olja Maričić  <https://orcid.org/0000-0003-4549-3438>  
 Anđelija Ivkov-Džigurski  <https://orcid.org/0000-0001-5267-2384>  
 Ivan Stojić  <https://orcid.org/0000-0003-3671-1624>  
 Ljubica Ivanović Bibić  <https://orcid.org/0000-0002-2409-3729>

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