D5.4.4: Study of effects of distance learning during the Covid-19 pandemic and development of proposals for effective online teaching in the future for similar circumstances

Regional Department of Education – Blagoevgrad

The Project is co-funded by the European Regional Development Fund (ERDF) and by national funds of the countries participating in the Cooperation Programme Interreg V-A "Greece-Bulgaria 2014-2020" .

Website: www.intersycii.eu

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Content

Abbreviations used

WHITE	Bulgarian language and literature
ZPAO	Law on preschool and school education
ICT	Information and communication technologies
MON	Ministry of Education and Science
NSI	National Statistical Institute
PMS	Resolution of the Council of Ministers
RDE	Regional Directorate of Education

1. Introduction

The contracting authority of this contract is the Regional Directorate of Education (RDE) - Blagoevgrad, a beneficiary of the project "Integrated Territorial Synergies for Health and Child Protection II" (INTERSYC II), financed under the INTERREG VA Cooperation Program "Greece-Bulgaria 2014-2020" according to contract No. B2.9a.03/5.09.2017

The INTERSYC II project is implemented jointly by four partners - two from Bulgaria and two from Greece, with the aim of developing the means of protecting children at risk and improving the level of health and social care for children in the cross-border region between Bulgaria and Greece.

As a result of the pandemic situation caused by the entry of Covid-19 into Bulgaria at the beginning of 2020, the Bulgarian Parliament declared a state of emergency throughout the country from March 13 to April 13, 2020 as a measure against limiting the spread of the coronavirus. Subsequently, several times the Minister of Health issued orders to declare an emergency epidemic situation on the territory of Bulgaria, which laid down a set of measures and restrictions in socio-economic life. One of these measures was related to the suspension of face-to-face classes (including practicums, internships, extracurricular hours, exams, dual education system, etc.) in primary and secondary schools and high schools - as in the academic year 2019/ 2020, as well as in the current year - 2020/2021.

Given the epidemic situation that has arisen, the Minister of Education and Science made a decision to switch to learning in an electronic environment at a distance under the conditions and in accordance with Art. 105, para. 6 and 115a, para. 1, 4 and 5 of the Preschool and School Education Act. As a territorial administration under the Minister of Education and Science for the management and control of the system of preschool and school education, RDE - Blagoevgrad primarily performs functions of implementing state policy in the field of preschool and school education on the territory of the respective district, and in the conditions of the Covid-19 pandemic and to support distance learning for students.

During the previous and current academic year, distance learning of students was conducted in the following time periods:

<table>
<tr><th rowspan="2">2019/2020 academic year</th><th>Distance learning period</th><th rowspan="6">2020/2021 school year</th><th>Distance learning period</th></tr>
<tr><td rowspan="5">From 16.03.2020 to 30.06.2020</td><td>From 29.10.2020 to 04.01.2021</td></tr>
<tr><td>For students from 5th to 12th grade - from 04.01.2021 to 27.01.2021</td></tr>
<tr><td>From 28.01.2021 to 21.03.2021 according to schedule - for students from 5th to 12th grade</td></tr>
<tr><td>From 22.03.2021 to 02.04.2021</td></tr>
<tr><td>In the period 12.04.2021 to 30.04.2021 according to the schedule - for students from 5th to 12th grade</td></tr>
</table>

Despite the quick organization for conducting training in an electronic environment, a number of difficulties were registered for both teachers and students, related to the teaching

method, the modification of the educational material for its electronic presentation, effective teacher-student communication, testing, technical security (availability of internet, computers/tablets, etc.) and others.

2. Characteristics of the educational system in Blagoevgrad district

According to NSI data, the population of the Blagoevgrad region for 2019 was 302,694 people, following the trend of sustained decrease from previous years (a decrease of 2,429 people or 0.8% compared to 2018). The share of women has a slight predominance (51.4%), and the population is mainly concentrated in the cities (60.2%), as well as in the municipality of Blagoevgrad, where nearly 25% of the district's population lives.

Characteristic of the district is the good provision of the population with educational institutions and teachers. During the academic year 2020-2021, 120 schools (including elementary, basic, secondary, unified, sports, professional and profiled) are operating, distributed in the 14 municipalities of the district.

Table 1. State of the education system in Blagoevgrad district

Type of schools	2019/2020 school year		2020/2021 school year	
	No. schools	No. enrolled students	No. schools	No. enrolled students
Primary schools (grades 1-4)	8	621	8	622
Primary schools (grades 1-7)	52	10,534	50	10,492
Secondary schools (grades 1-1 2)	26	11,205	26	11,735
United (grades 1-10)	10	1,595	10	1 494
Sports school (grades 1-12)	1	121	1	137
Vocational high schools (grades 8-12)	18	5 156	18	5,725
Profiled high schools (grades 8-12)	7	4 160	7	4,218
TOTAL	**122**	**33,392**	**120**	**34,423**

Source: RDE - Blagoevgrad

It is characteristic that the technical colleges and vocational schools are built and function only in the centers of the municipalities. Secondary general education schools are built both in the centers of the municipalities and in some other settlements. The number of primary schools operating in the majority of settlements with established educational institutions is the largest. Primary schools are located only in the constituent settlements of 10 of the municipalities (with the exception of Bansko, where there is a primary school in the center of the municipality). Special schools are built in 7 municipalities, covering students from all regions, therefore they have supra-municipal significance.

In addition, an important role is played by the two higher education institutions on the territory of the district, which are of national importance (Southwestern University "Neofit Rilski" - Blagoevgrad and American University in Bulgaria - Blagoevgrad), as well as the colleges concentrated mainly in the regional center of Blagoevgrad (Medical college in the structure of the Medical University - Sofia, Technical College in the structure of the Southwest University and College of Tourism - Blagoevgrad).

3. Status of online education in Blagoevgrad district

In order to establish the state of online education in the Blagoevgrad region, introduced in March 2020 as a result of the Covid-19 pandemic throughout the country, data from various sources have been collected and analyzed, which can generally be summarized in two main groups - conducting a survey and analysis of quantitative data regarding the educational results (grades) of the students, provided by RDE-Blagoevgrad.

The survey among teachers and students was conducted in April 2021 and covered all schools in the Blagoevgrad region. Accordingly, 1,189 teachers and 6,052 students of all classes participated in it. The purpose of the study is to establish the opinion and assessment of the two target groups - teachers and students, regarding various aspects of online education in Bulgaria to define its strengths and weaknesses, as well as recommendations for its implementation in the future, when the need arises. .

The research identifies and analyzes the main factors that influence educational effectiveness, considering that, in addition to availability and access to technology and educational resources, the motivation and competences of teachers, structured teaching, the application of systems play a key role in the effectiveness of distance learning to adapt and support learning, and to provide feedback. The role of students' independent study and time management skills is also reported. Special attention is given to the motivation to learn and the students' engagement with learning and with the school. The role of parents is considered, as is the interaction and cooperation between teachers and parents.

To collect the quantitative information, two questionnaires were developed - aimed at the students and at the teachers. Accordingly, the survey cards represent a combination of open and closed questions, a significant part of which are repeated in the two surveys in order to compare the obtained evaluations of the different positions in the educational process of the two groups of respondents.

The survey card for teachers (Appendix 1 to this document) includes a total of 18 questions, allowing to gather the necessary information (organizational issues and support, technical support, problems of a different nature, etc.), as well as to determine the effectiveness of this type of training, including compared to the present form and identification of the main problems/limitations for distance learning in Bulgaria, formulation of recommendations.

The survey card for students (Appendix 2) covers 14 questions that reveal the respondents' position on distance learning in general, their difficulties, including in terms of providing technical means and a suitable place and atmosphere at home, for effective learning in an electronic environment. Students also have the opportunity to share their recommendations for its improvement in the future.

In addition, on the basis of data provided by the Contracting Authority, ***information was processed regarding the educational results for the last three completed academic years*** (academic year 2018-2019, academic year 2019-2020 and academic year 2020-2021) - respectively received from the national external evaluation after the 4th , 7th and 10th grades and the state matriculation exams. In this way, a comparison and comparison of the obtained grades of the students in school years with and without distance learning is made.

The contractor has thoroughly familiarized himself with the report of the 2020 "Evaluation of the Impact of Distance Learning in Electronic or Other Non-Present Forms on the Effectiveness of School Education" (Institute for Research in Education) [1], the main assumptions of which are also provided in the present study:

- The quality of the technologies used in distance learning in an electronic environment have a positive relationship with learning outcomes

[1] www. ire-bg.org

- The way technology is used in the teaching process affects learning outcomes
- The attitude of teachers towards the technologies used in the distance learning process has an impact on learning outcomes
- Teacher motivation is related to the effectiveness of teaching and learning in distance learning in an electronic environment
- Student engagement and motivation has a positive relationship with the effectiveness of distance learning in an electronic environment
- Student engagement contributes to the utilization of learning time and learning opportunities, which are essential factors for an effective educational process
- Students' emotional, cognitive and behavioral engagement contribute to knowledge acquisition and skill formation
- Engagement and motivation to learn affects both academic achievement and student retention in school. Conversely, disengagement and demotivation lead to an increased risk of learning loss and dropping out, which are the main expected adverse effects of the suspension of attendance due to the Covid-19 pandemic

In this context, the present study was designed and conducted, specifically targeting schools in the Blagoevgrad region to establish the effects of distance learning during the Covid-19 pandemic at the regional level. Accordingly, teachers and students of all grades from 1st to 12th grade were included in the survey. They are represented unevenly, but given the large sample for both target groups, there is a sufficient number of representatives in each of the classes, in the respective grouping, evident from the following graphs.

Figure 1. Distribution by class - teachers (Question 1)[2]

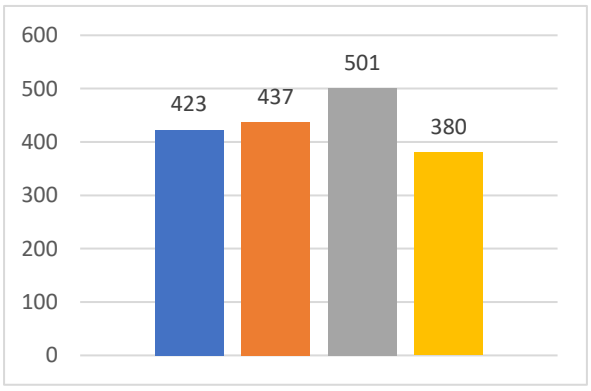
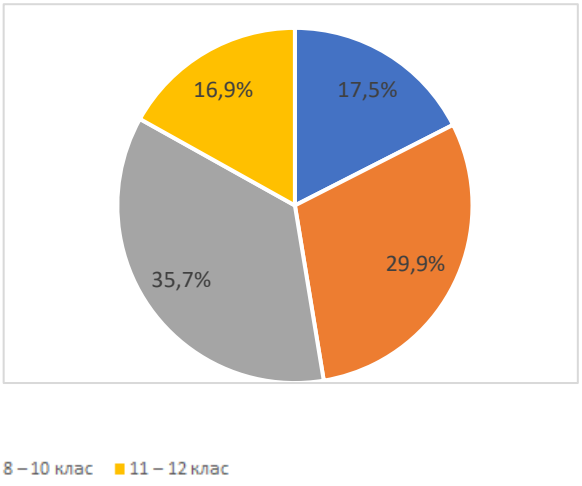


Figure 2. Distribution by class - students (Question 1)



Source: Teacher and student questionnaires, own calculations

The survey found that a significant number of teachers had prior training (e.g. in a professional qualification course or other) on the specifics of teaching online - 64.5% of respondents, which was identified as a serious reason for the successful and rapid transition to

[2] *The total number of responses exceeds the total number of respondents, as the question allows for more than one answer, in cases where one teacher teaches in different classes.*

distance learning in our country in March 2020. Some teachers share that they were currently involved in training for working in Microsoft Teams.

Figure 3. Preliminary preparation of teachers for conducting online training (Question 3)*

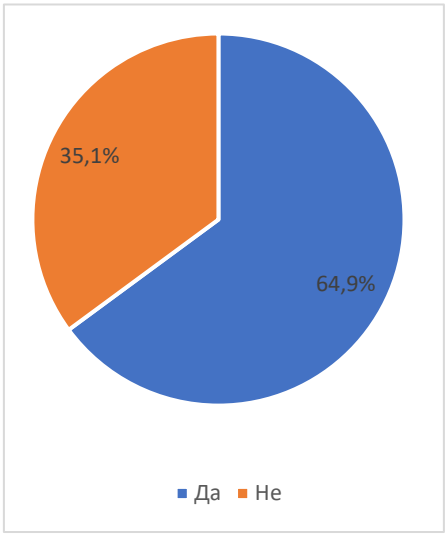
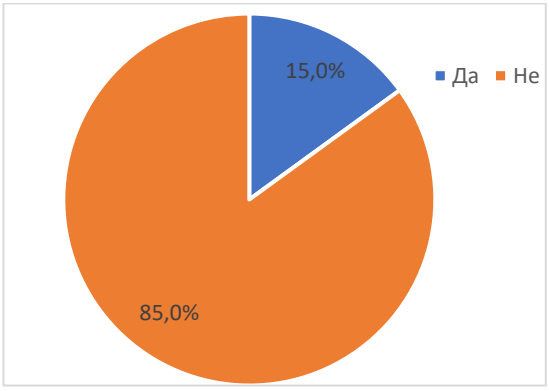


Figure 4. Received instructions from teachers for conducting online learning (Question 4)

Source: Teacher questionnaires, own calculations

At the same time, 85% of students share that before the start of distance learning imposed by the Covid-19 pandemic , they participated in other online learning extracurricular forms (eg online courses, etc.). However, the overall high literacy for working with various technical devices has compensated for the lack of specific training.

Figure 5. Students' previous participation in different online courses (Question 2)



Source: Student questionnaires, own calculations

Next, it was investigated what technical device was used by the two groups of respondents. For teachers, these were most often laptops and stationary computers, in extremely rare cases – mobile phones (smartphones). With students, however, the picture is different - nearly half of them used smartphones, which significantly limits and complicates learning. The other half of the students surveyed said they used laptops and desktop computers.

Figure 6. Technical device used in online learning due to COVID-19 by teachers (Question 5)[3]

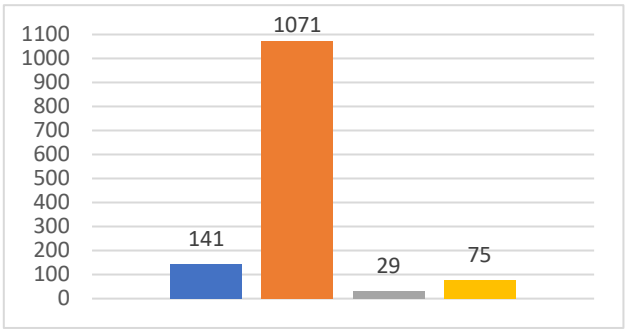
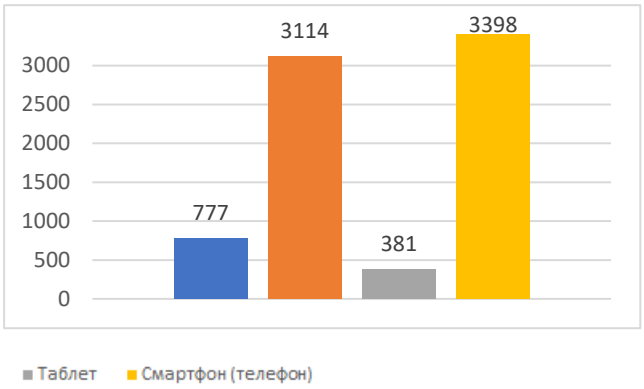


Figure 7. Technology device used in online learning due to COVID-19 by students (Question 5)[4]

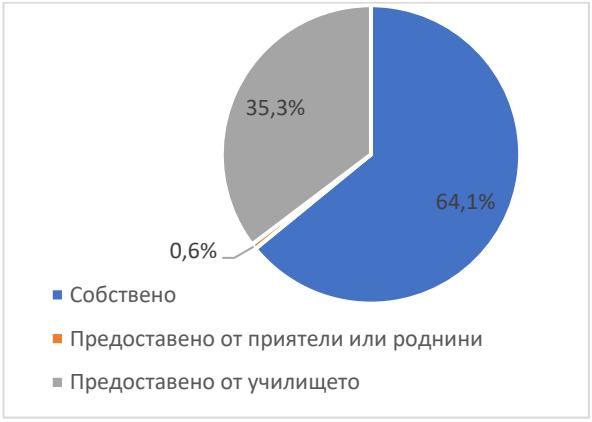


Source: Teacher and student questionnaires, own calculations

In addition, it was investigated whether teachers used their own technical device, which was found to be valid in 64.1% of cases. The rest of the teachers received a device from the respective school, which shows the ability of the system to react and provide the most basic for the realization of distance learning and especially in extraordinary circumstances.

Figure 8. Ownership of the technical device used by teachers in online learning due to COVID-19

(Question 6)



Source: Teacher questionnaires, own calculations

Technical problems of a different nature are a serious obstacle to distance learning. It turns out that teachers from the Blagoevgrad region did not face serious problems of this nature, as every second respondent said that they had no problems, and another 45.7% said that this happened only sometimes. Among the students, the distribution of opinions is similar - a total of 88.4% of them share that they have had no problems or have had them sometimes (with the share of the latter prevailing).

[3] *The total number of responses exceeds the total number of respondents because the question allows for more than one answer.*

[4] *The total number of responses exceeds the total number of respondents because the question allows for more than one answer.*

Figure 9. Technical problems with the device during the online training of the teachers (Question 7)

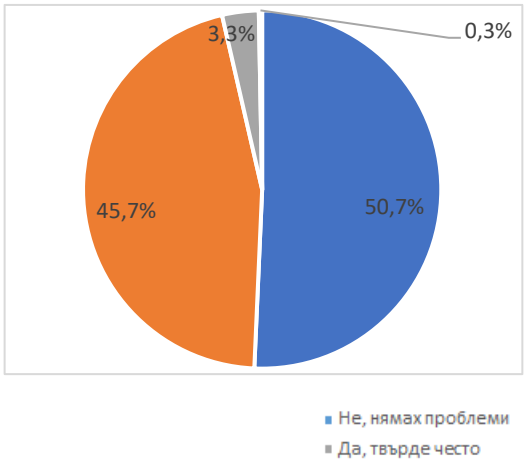
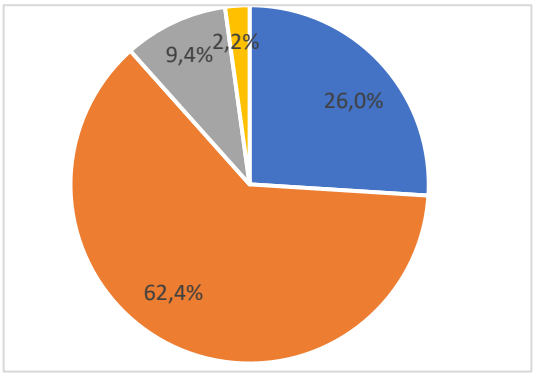


Figure 10. Technical problems with the device during online learning among students (Question 6)



Source: Teacher and student questionnaires, own calculations

The picture is similar in connection with problems with access to the Internet during online learning. In both groups of respondents, the answers that there were no problems or it happened only sometimes prevailed - a total of 90.9% of the teachers and 89.0% of the students.

Figure 11. Internet connection problems during online teacher training (Question 8)

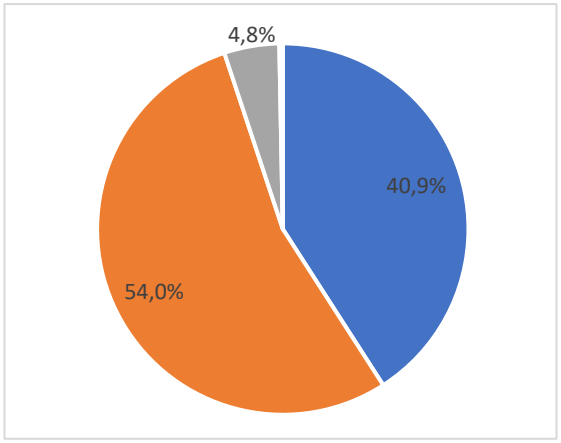
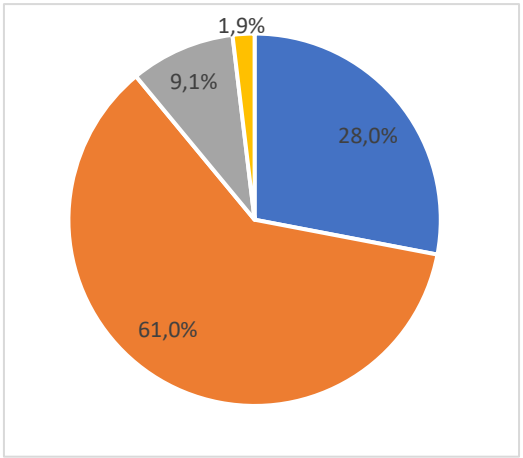


Figure 12. Internet connection problems during online learning among students (Question 7)

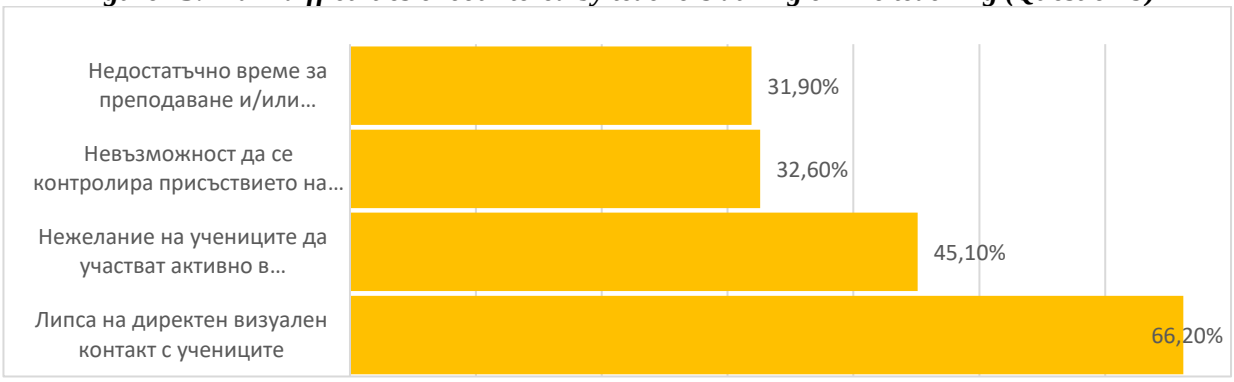


Source: Teacher and student questionnaires, own calculations

A major difficulty that teachers identify with online teaching is the lack of direct visual contact with students. Such an answer was given by 66.2% of the respondents, and the students'

reluctance to actively participate in the educational process (45.1%) and the impossibility to control the students' presence during the lessons (32.6 %). 31.9% of teachers share that the main problem for them is insufficient time for teaching and/or testing in shortened online classes. This is especially true for the introductory course, when basic skills are still being learned, so patience with students and enough time to focus is needed.

Figure 13. Main difficulties encountered by teachers during online teaching (Question 9)



Source: Teacher questionnaires, own calculations

With a relatively small share are problems such as conducting tests and technical provision/access to the Internet (these answers logically correspond to the already analyzed above situation regarding these issues). Some teachers also reported that they had problems related to:

- Significantly greater information load for both teachers and students
- Lack of physical activity
- The practical part of the interest classes
- The negativity prevalent in society regarding online learning

According to the surveyed teachers, the most difficult subjects to teach are physical education (55.9%), mathematics (38.2%), music and fine arts (21.8%), special subjects in vocational high schools (20.6%) and natural sciences such as chemistry, biology, etc. (16.3%). Disciplines such as foreign languages, technology and entrepreneurship, philosophy and civic education, informatics and information technology, geography and history, Bulgarian language and literature are indicated by a relatively small share of teachers (less than 15%).

Figure 14. Which subjects are most difficult to teach online (Question 10)

Source: Teacher questionnaires, own calculations

The teachers' answers about whether online learning has improved their teaching skills are interesting, as 71.7% of respondents give a positive assessment. This is complemented by the students' evaluations - when asked how their teachers had done, the opinions shared were

overwhelmingly positive - the answers "excellent" and "very good" were 38.1% and 29.6% respectively.

Figure 15. Has online learning improved teacher qualities (according to teachers) (Question 14)

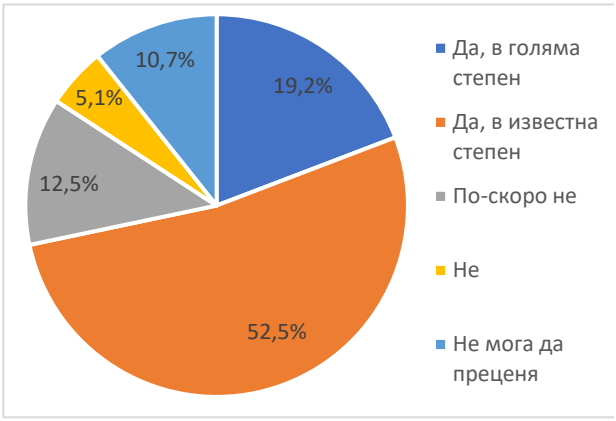
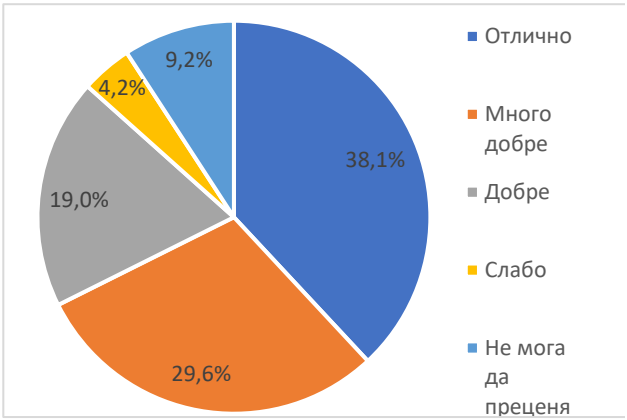


Figure 16. How successful teachers were in teaching the learning material (according to students) (Question 10)



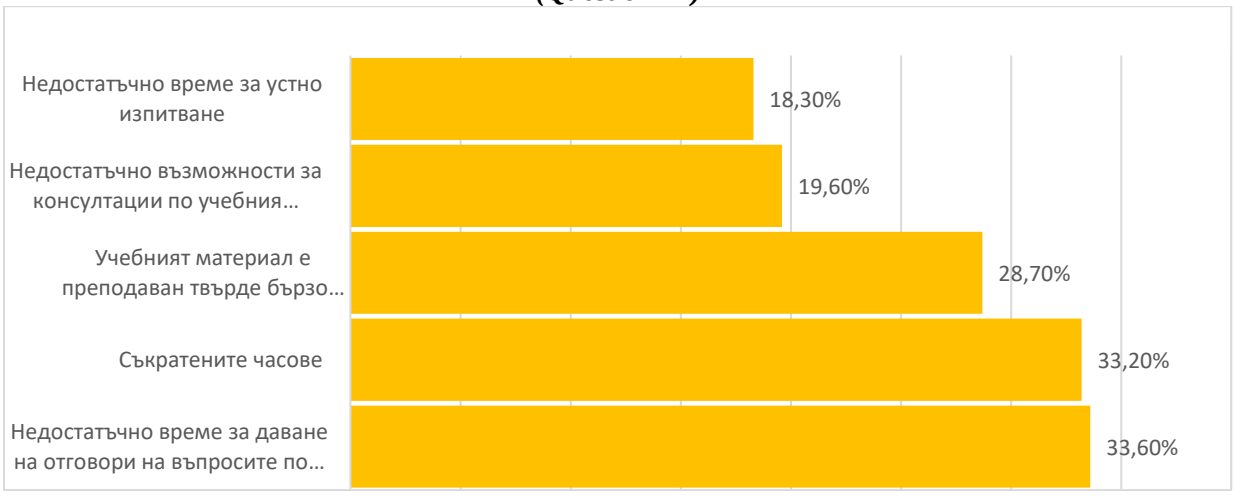
Source: Teacher and student questionnaires, own calculations

Students outline the following as the main weaknesses of their teachers during online learning:

- Insufficient time to answer questions during tests (33.6%)
- Reduced hours (33.2%)
- Learning material was taught too quickly or too unclearly (28.7%)
- Insufficient possibilities for consultations on the study material (19.6%)
- Insufficient time for oral examination (18.3%)

It is important to note that these opinions are largely related to the length of the lessons - something that does not depend on the teachers and objectively limits their opportunities to structure the conduct of the lessons in a way that leaves enough time at the same time for quiet teaching the new material, counseling and at the same time testing the students.

Figure 17. Main weaknesses admitted by teachers during online learning (according to students) (Question 12)



Source: Student questionnaires, own calculations

In this regard, students make the following recommendations to their teachers in the event of conducting online training in the future:

- To be more innovative, to use more presentation materials and a variety of videos, platforms, games and other applications so that lessons are more interesting
- To improve their technical skills and knowledge of available information technologies and systems
- To teach the new learning material more slowly and in detail, devoting more time to the more difficult lessons
- To record the lessons through Microsoft Teams so that the students can listen to them further in case of ambiguities
- To provide individual consultations
- Take full control of the platform being used (so as to limit the possibility of students being muted or 'dropped' out of class)
- To be taught with the camera on by both teachers and students
- To better plan the time of the lessons so that the students do not have to compensate with more homework than in face-to-face learning
- Give more opportunities for students to express themselves - for example, by giving a presentation, teaching a lesson, writing on the electronic board, etc.
- To improve and increase communication with students
- To show more patience and understanding towards students
- Don't get angry, be positive and smile!

It is important to note that a significant number of students shared that they did not actually have any recommendations because their teachers did an excellent job.

It is interesting to compare the opinions of teachers and students in relation to learning the learning material. It turns out that teachers and students have a similar feeling on this issue, which is also objectified by the students' evaluations of their knowledge. The share of students who received higher grades compared to the period of attendance was 26.5%, which corresponds to the teachers' opinion that nearly every 5th student did well in the new way of learning. At the same time, students with no change in grades were 57.1%, given the fact that, according to teachers, 52.5% of students coped "to some extent" with learning the material during online learning. This does not have an overall effect on grade levels, as the proportion of students who have lower grades (16.4%) than before is consistent with teachers' opinions that students have not coped with online learning (17.6 %).

Figure 18. How successfully the students coped with learning the learning material (according to the teachers) (Question 11)

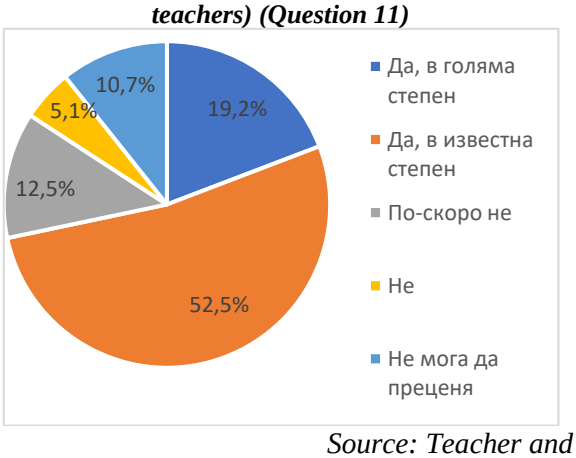
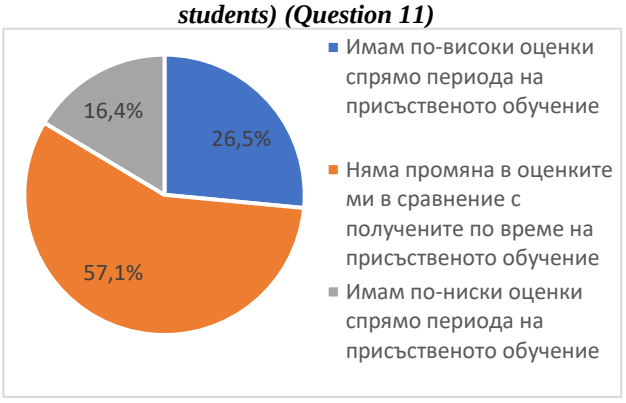


Figure 19. How successfully the students coped with learning the learning material (according to the students) (Question 11)



Source: Teacher and student questionnaires, own calculations

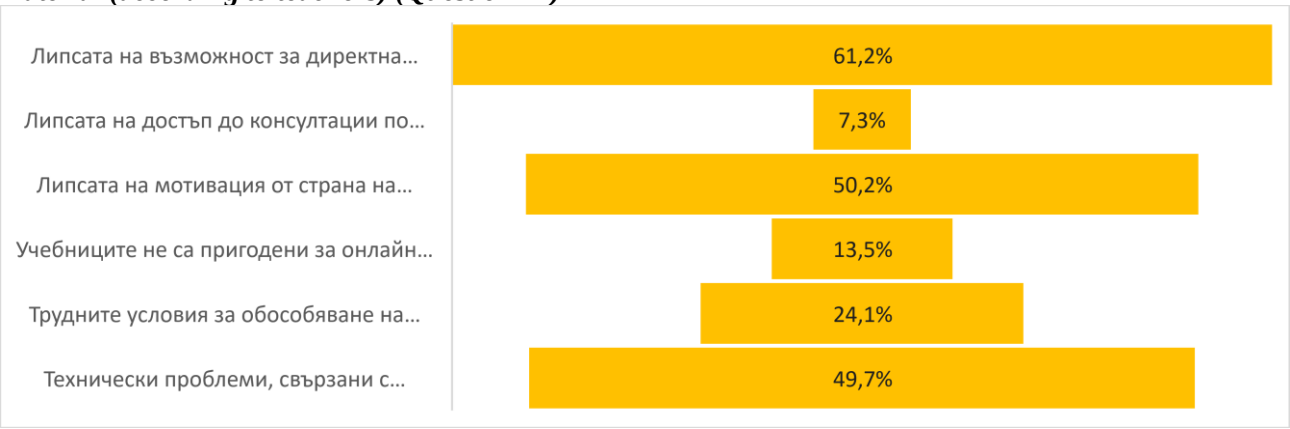
What, to the greatest extent, made it difficult for students during online learning in learning the learning material, according to the teachers, was mostly the lack of possibility of direct communication with the teachers (61.2%), logically arising from the unpreparedness of the system for transition to online learning in a short period of time, which in turn is mainly due to:

- Lack of preparation of teachers for teaching in an electronic environment (including for using the various possibilities offered by the platforms implemented in Bulgaria during the pandemic, such as Teams)
- Lack of specifically developed textbooks and learning aids in an electronic environment
- Lack of habits among teachers and students for this kind of learning as part of the learning process in principle (following the example of Finland)
- Lack of diverse platforms and ICT applications to support and diversify the learning of the various disciplines in the form of a game, including allowing interaction between students, etc.

Next is the problem of lack of motivation (50.2%) among students, which further deepens after a long period of online learning. Moreover, the problem is present in students of all grades - from the youngest to the oldest. This is explained on the one hand by the new conditions for conducting the educational process - completely atypical for the Bulgarian education system up to that point, which objectively requires a period of adaptation, not only for the students, but also for their parents, whose role in conditions of online learning is growing tremendously. On the other hand, the reason that forced the urgent transition to such a form of education, namely the Covid-19 pandemic and the related uncertainty and fear characteristic of the entire society , has a particularly strong impact on children, which also raises the question of ensuring their mental health, including in the context of education and emphasizing the need for psychological counseling for students and especially those who demonstrate a particular degree of anxiety or have suffered a personal loss within the family as a result of the virus.

The problem related to the devices and/or the Internet connection is only in third place (49.7%). Comparing this data with the analysis of other parts of the survey (Figures 10 and 12), it can be seen that this problem does not have as much weight as exposed in public opinion. This positive fact allows directing the focus towards solving the main problems described above in future online education in our country.

Figure 20. What made it most difficult for students during online learning to learn the learning material (according to teachers) (Question 12)

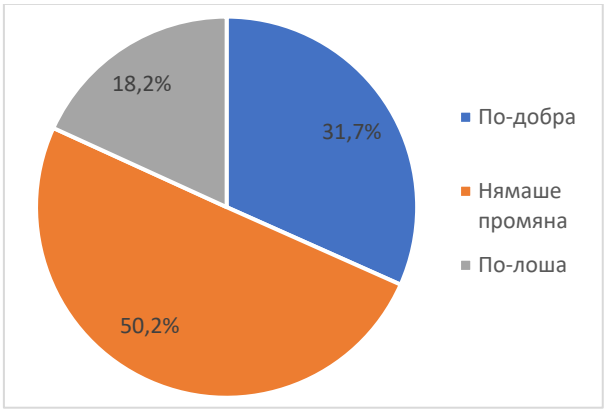


Source: Teacher questionnaires, own calculations

Special attention in the study is paid to discipline, and the answers of the surveyed teachers are unexpected. It turns out that there is a deterioration in discipline according to only 18.2% of them, and every second thinks that no change has occurred. Moreover, in 31.7% of the cases there was an improvement in the discipline compared to the present form of training.

Figure 21. Student discipline during online versus face-to-face learning

(Question 13)



Source: Teacher questionnaires, own calculations

It is also important to note the contribution of parents, who were able to provide an optimal learning environment for children - 90.1% of students shared that they had a designated place at home (e.g. a separate room, a separate desk) where they could study and 93.2% had the peace and quiet they needed while studying from home. At the same time, according to the teachers, the significance of this factor during online learning due to the Covid -19 pandemic is higher (figure 20), as 24.1% of them believe that this made it difficult to conduct the training and, accordingly, to learn the material from the students.

Figure 22. Having a dedicated place at home for studying (Question 8)

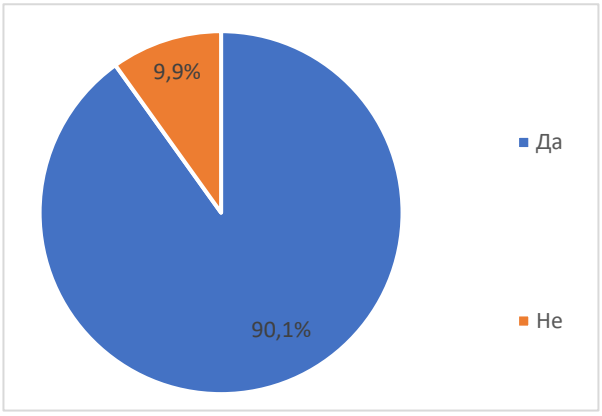
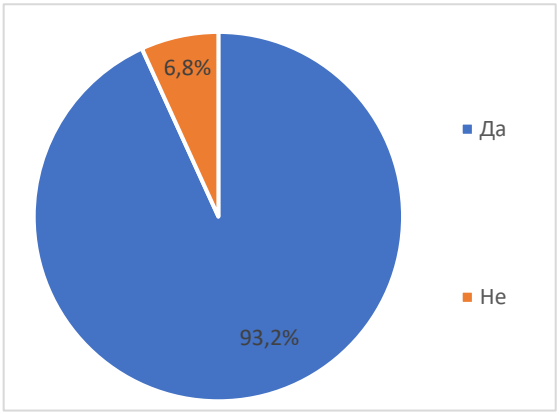


Figure 23. Sufficient peace and quiet to study provided (Question 9)



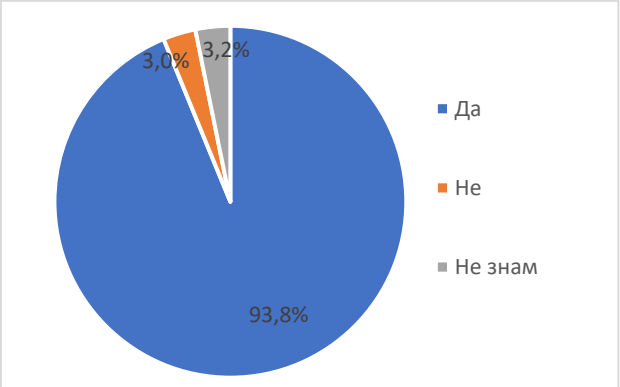
Source: Student questionnaires, own calculations

It is important to note that more than 93.0% of the surveyed teachers confirm that in the school where they teach, an established protocol (method, system, sequence of actions) is applied

to prevent infection with Covid-19 during attendance training, the result of the efforts of all involved parties – school administration, the Ministry of Education and its regional structures.

Figure 24. Implementation of an approved protocol for the prevention of infection with Covid-19 during face-to-face learning in schools

(Question 15)

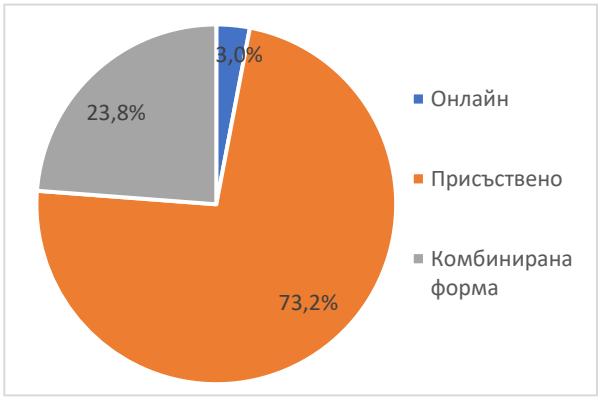


Source: Teacher questionnaires, own calculations

Despite the identified number of positive aspects and the relatively successful transition to online education in our country, the overall assessment of its effectiveness compared to traditional face-to-face education is low. The teachers are categorical that this form of training is not effective - as many as 83.2% of the teachers.

Figure 25. Effectiveness of online learning compared to traditional face-to-face learning (Question 2)

Figure 26. In the future, which teaching method would you prefer (according to teachers) (Question 16)

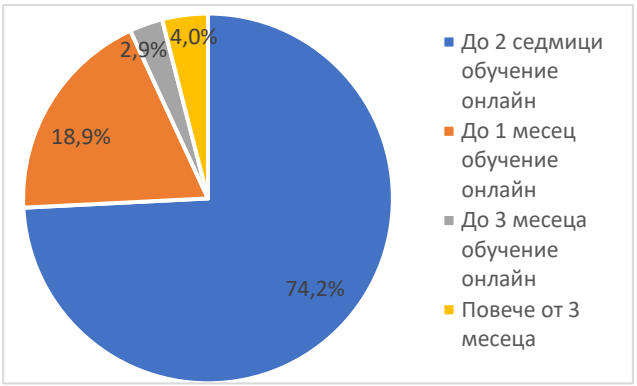


Source: Teacher questionnaires, own calculations

In addition, 73.2% of teachers are in favor of face-to-face classroom learning in the future, and another 23.8% of a combined form of learning, alternating between online and face-to-face learning, if necessary. In this case, the maximum duration of an online learning period should not be longer than 2 weeks (74.2%) or 1 month (18.9%).

Figure 27. The maximum duration of one study period online in the future

(Question 17)

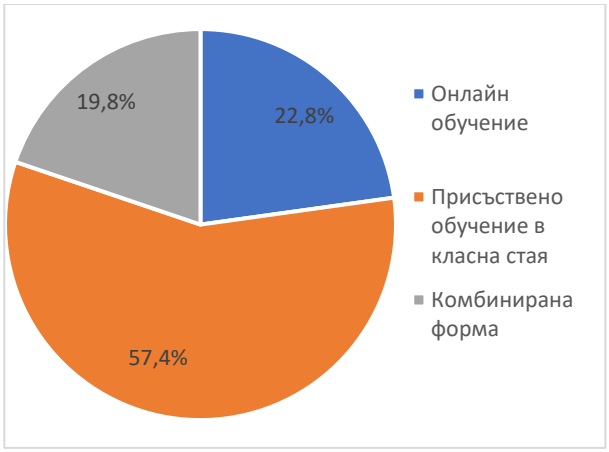


Source: Teacher questionnaires, own calculations

Students, for their part, also prefer face-to-face learning, as this opinion is shared by 57.4% of respondents, and another 19.8% like the combined form.

Figure 28. In the future, which teaching method would you prefer (according to students)

(Question 13)



Source: Student questionnaires, own calculations

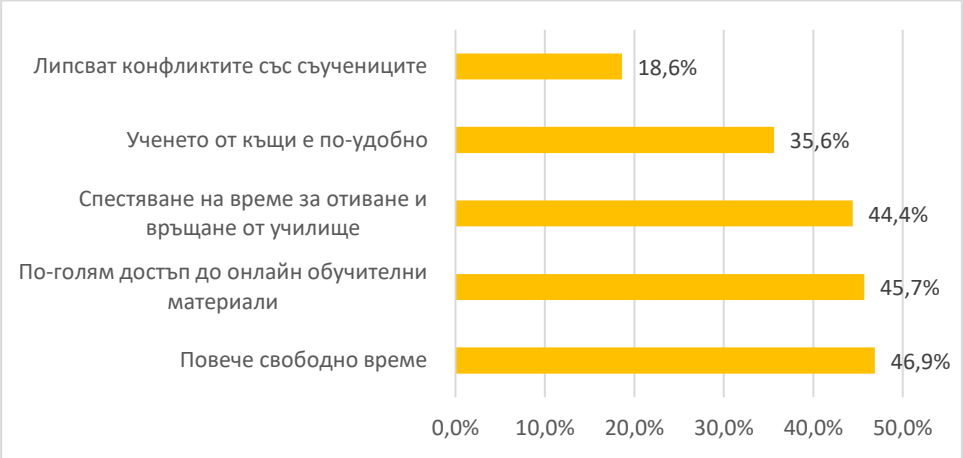
Among the benefits of online learning, students highlight the following in particular:

- More free time (46.9%)
- Greater access to online learning materials (45.7%)
- Saving time traveling to and from school (44.4%)
- Studying from home is more convenient (35.6%)
- There are no conflicts with classmates (18.6%)

Although statistically insignificant from the total number, the following opinions are also found:

- Students' independence is encouraged
- No need to carry heavy backpacks
- Irritants are reduced and anxiety from classmates is eliminated (especially valid for children with disabilities or learning difficulties)

Figure 29. Main benefits of online learning (Question 3)[5]

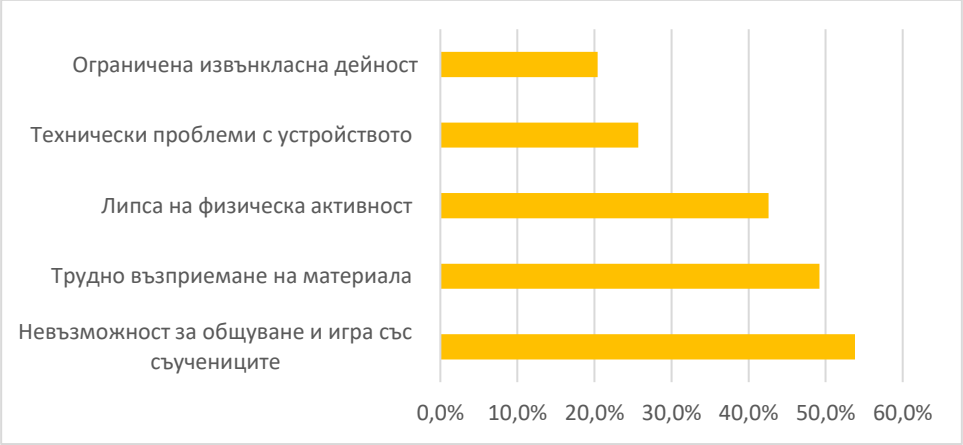


Source: Student questionnaires, own calculations

Among the disadvantages of online learning, the surveyed students shared the following most often:

- Inability to communicate and play with classmates (53.8%)
- Difficult comprehension of the material (49.2%)
- Lack of physical activity (42.6%)
- Technical problems with the online learning device (25.7%)
- Limited extracurricular activities in the form of courses, Olympiads, excursions, etc. (20.4%)

Figure 30. Main disadvantages of online learning (Question 4)[6]



Source: Student questionnaires, own calculations

In this way, the recommendations that the surveyed teachers make in relation to conducting online training in the future, so that it can be improved, are also shaped:

[5] *The shares of the individual answers exceed 100% as a sum, since the question allows for more than one answer.*
[6] *The shares of the individual answers exceed 100% as a sum, since the question allows for more than one answer.*

- Providing teachers and students with technical means and a good internet connection
- Provision of textbooks adapted to online learning
- Providing more electronic resources to help the teacher, with a practical focus
- Conducting specialized courses for conducting online training for teachers, including to develop skills to create interactive resources that are diverse and interesting for students
- Introducing subject matter to clarify and prepare students for learning in an online environment
- Running a campaign to present online learning as something normal and useful
- To provide a flexible curriculum
- Extension of school hours
- Students to work with cameras on
- To have regulated requirements from the Ministry of Education and Culture for students
- Student absences to be automatically generated and synchronized with the electronic diary
- Ability of the platform to edit student texts
- Implementation of better parental control for attendance of students in classes

In addition to this data, an analysis was made of the educational results obtained from the national external assessment (after the 4th, 7th and 10th grades) and from the state matriculation exams in the last three academic years: 2018-2019, 2019-2020 and 2020-2021 i.e. the period covered allows comparison of data in an academic year with full face-to-face learning (2018-2019), with a small share of distance learning (2019-2020) and in a year with predominant distance learning, especially valid for students in the 5th grade and above.

National external evaluation after the IV grade during the 2018-2019 school year was conducted in 4 subjects - Bulgarian language and literature (BEL), mathematics, man and society, man and nature. In the next academic year (2019-2020), due to the emergency situation as a result of Covid-19 , which led to an urgent transition to distance learning, as well as its long period without interruptions, the graduation exams for the youngest students were postponed, and in the academic year 2020 - In 2021, only the BEL and mathematics exams were held. Accordingly, the comparison of the educational results of the students after completing the IV grade is possible only in these two subjects.

In addition, during the 2020-2021 school year, a new format of the national external assessment is being introduced in grade IV , the purpose of which is to measure the results laid down in the standards for general education preparation and in the new curricula with equality of students at the national level. The BEL exam involves dictation from an audio file and direct filling in of answers on an answer sheet [7].

Accordingly, the average BEL results in schools in the Blagoevgrad district for the 2020-2021 academic year are 72.02% (average percentage of the maximum number of points) and are slightly lower than the national average for the same year (74.5%). Also, BEL results in the last academic year are slightly lower than reported in the 2018-2019 academic year (74.72%), but the decrease is minor and within the normal range between individual academic years and before distance learning in period 2020-2021, therefore, are indicative of a high degree of achievement of the state educational requirements for the educational content for the initial stage of basic education in the Blagoevgrad district.

[7]Source: MES

At the same time, the results of the mathematics exam are less favorable - the average results in the Blagoevgrad district for the 2020-2021 school year equal 59.71%, reporting a decrease of more than 18% compared to the 2018-2019 school year (73.46 %). At the same time, a serious decrease in mathematics results was registered across the country - from 75.25 in 2019 to 63.14% in 2021, therefore the trends observed at the regional level in Blagoevgrad are a reflection of the trends across the country .

In general, for the academic year 2020-2021, the districts with the highest results in both subjects are Sofia, Smolyan, Varna and Ruse. The schools with the highest BEL results are only from the capital. Schools from Stara Zagora, Ruse, and Pazardzhik are also among those who excel in mathematics.

Nearly two-thirds of fourth-graders performed reasonably well on the creative task, but producing complete, coherent, and grammatically correct writing continued to be a challenge.

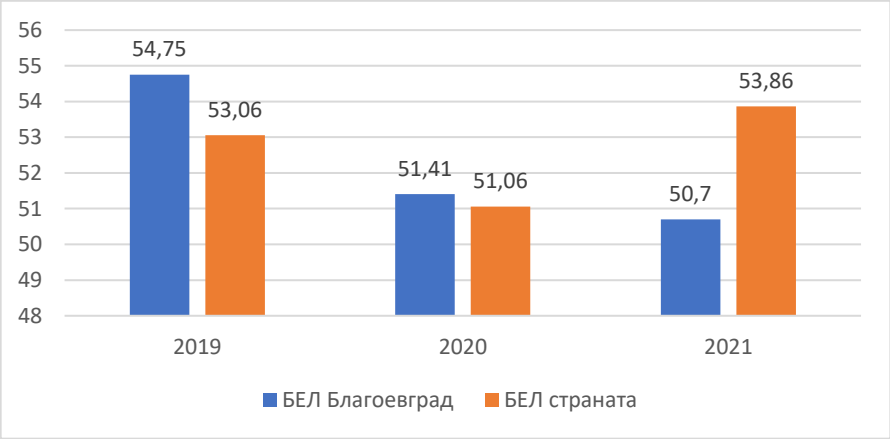
In mathematics, a high level of arithmetical operations and problems for the face of a rectangle, recognition of a right angle, and word problems have been mastered. Difficulties are mostly identified in tasks that require thinking - choosing the most rational way to solve, extracting and processing information from tables and diagrams, spatial orientation.

The national external assessment after grade VII covers two subjects - BEL and mathematics, and has been conducted for each of the last three school years. According to BEL, the reported average results of students from the Blagoevgrad district vary slightly during the observed period, being close to and even higher than the average for the country. Accordingly, for the 2020-2021 school year, the average BEL score is 50.7% (average percentage of the maximum number of points), decreasing from 54.75% reported for the 2018-2019 school year. For comparison, for the last academic year the average for the country is 53.86%.

Compared according to the methodology of the Ministry of Education, these grades, however, equal "good 4". Grammar, syntax and interpretation of a text are found to be the most difficult for students as opposed to finding information in a text, lexicology and recognizing facts from a literary text.

The lowest results in BEL were recorded in the districts of Shumen, Sliven and Yambol, and the best - in the mathematics schools in the country, especially in Sofia, Smolyan and Pernik.

Figure 31. Results of the National External Evaluation of BEL after Grade VII for the last 3 school years, average percentage of the maximum number of points

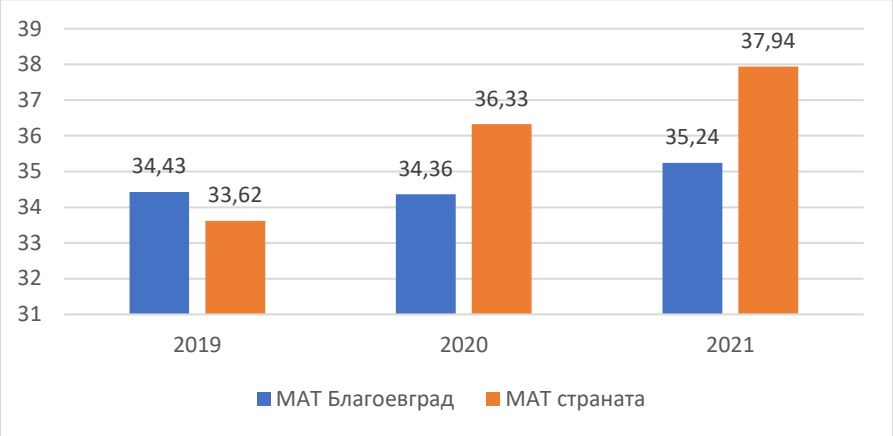


Source: *RDE-Blagoevgrad, own calculations*

The results of the National External Assessment in Mathematics after grade VII also varied little over the 3-year period, remaining relatively high compared to the results at the national level and at the same time significantly lower than the BEL results. For the 2020-2021

school year in the Blagoevgrad district, the average grade is 35.24% compared to 37.94% for the country and 34.43% in the 2018-2019 school year. After equalization, these results correspond to an "average 3" grade, which is the average grade for this subject consistently in recent years.

Figure 32. Results of the National External Assessment in Mathematics after Grade VII for the last 3 school years, average percentage of the maximum number of points



Source: *RDE-Blagoevgrad, own calculations*

The main difficulty is geometry and writing the solution to a given problem. Problem is identified in modeling numerical expressions, reading data and tasks with practical application of what has been learned. In the algebra part, the results are better - including solving problems for finding the root of an equation, inequality, abbreviated multiplication formulas and applying a learned algorithm.

The lowest results in mathematics were recorded in the districts of Vidin, Shumen and Montana, and the best - in mathematics schools in the country, especially in Sofia, Varna and Smolyan.

The problem of poor results in mathematics is addressed through a number of measures to increase interest in mathematics and natural sciences - by providing prepared and motivated teachers, more methodological support from regional education authorities, more qualification on the application of the competence approach, and also by providing of additional funds. It is planned to allocate funds for the purchase of more materials to illustrate the learning process.

It should be noted that in the last academic year a new format of the exam was introduced, for several reasons - students were taught according to new programs, the matriculation exams now cover the material for the Vth , VIth and VIIth grades, the exam is unified, the distribution of tasks is different and carry a different number of points. Weaknesses that have been identified in previous years are overcome, encouraging students to write on BEL and solve open-ended questions. Also, more tasks are included not just to check knowledge but also to solve life cases. Thus, the post-examination results for the academic year 2020-2021 show a serious increase in the number of excellent grades and a decrease in poor grades.

The National External Assessment after Grade X was conducted for the first time in 2021, in response to the statutory requirements to assess the final of the first upper secondary stage. Due to the Covid-19 pandemic, the pilot run of this matriculation exam was postponed for one year. The evaluation covers BEL and mathematics as compulsory subjects, and if desired, students can take additional exams - in a foreign language and to determine the level of digital competences. Upon achieving 60% of the maximum number of points in the foreign language assessment, students receive a level certificate according to the Common European Language

Framework, and with at least 50% of the maximum number of points in information technology – a level document according to the European Reference Framework for Digital Competences.

Accordingly, the results in BEL are better than those in mathematics, with the average score in BEL being 22.50 points out of a maximum of 50 (45%). The success rate in mathematics is lower - on average 13.84 (27.68%). Nine students have zero points in both subjects. In both exams, neither achieved the maximum score.

In general, 10th graders easily retrieve information from text and tables in multiple-choice tasks, but have trouble processing information when they are asked to respond freely. 86% of students know the dictionary meaning of the words. Nearly 2/3 of them demonstrated that they could formulate one or two brief counterarguments to a given statement.

Many of the tenth graders preferred to write a thesis without tying it to the excerpt from the specified literary text being studied. 18% of them failed the editing task.

Mathematics tasks test the acquired knowledge and acquired skills for understanding concepts, applying mathematical properties and theorems, etc. With the maximum number of points are 29 tenth graders, 285 did not solve any problem correctly.

Among the regions with the highest results in both subjects are Sofia, Smolyan, Varna, and Razgrad is next in line. The strong performance in mathematics of the tenth-graders from Yambol and Kardzhali, who in Bulgarian language and literature showed significantly lower results compared to the students from the other regions, is impressive.

The schools with the highest results in both subjects are mostly mathematics and language high schools from the big cities - Sofia, Burgas, Plovdiv, Varna, Ruse.

In the Blagoevgrad district, the average grades are 44.4%, which is close to the average for the country (44.4%), and in mathematics they are even higher - 30.6%. The grades obtained in optional subjects are high: in foreign languages, the average grade is 77.2%, and in determining the level of digital competences – 66.2%.

The state matriculation exams cover two exams - a compulsory BEL and a second subject of the student's choice, from among the following disciplines:

- Mathematics
- Foreign language (optional: English, Russian, German, French, Spanish, Italian)
- History and Civilization
- Geography and Economics
- Philosophical cycle
- Chemistry and environmental protection
- biology and health education
- Physics and Astronomy

In addition, some students also take a state exam to obtain a degree of professional qualification in occupations from the list of occupations for vocational education and training.

With the regular result of the state matriculation exam in BEL for the academic year 2020-2021 is 52.44 points, which corresponds to a grade of good (4.14). This value is fully comparable with the data of the previous two years. The difference with the previous school year is insignificant, but this year's result is almost two points higher compared to the 2018-2019 school year , in which the training was fully attended.

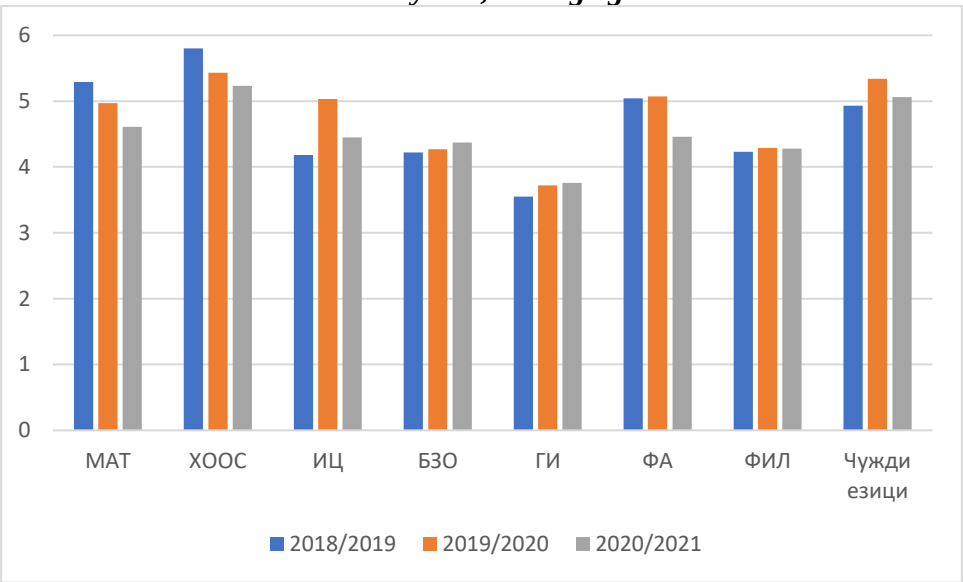
The results of the exams in the other academic subjects are also comparable to the previous years , considering that the exams this year included the same volume of educational material with the same degree of complexity as in the previous two academic years.

Traditionally, the highest number of points is in the matriculation exams in foreign languages, and the smallest – in the subjects preferred by the most matriculates – biology and health education, geography and economics and philosophical cycle. However, in the last session, the average result of the philosophy cycle examination was the highest since

matriculation exams were held. There is a smooth trend towards an increase in the number of points in geography and economics. There are high and stable results in chemistry and environmental protection, which can be explained by the high motivation and the small number of high school students who passed the exam in this subject.

In the Blagoevgrad district, the BEL grades did not show any serious changes during the observed three-year period, from 4.05 for the 2018-2019 school year, to 4.24 in the following and 4.19 after the last school year, moving around the average for the whole country. No serious changes were registered in the other subjects either, as can be seen from the following graph.

Figure 33. Results of the state matriculation exams in an optional subject for the last 3 academic years, average grade



Source: *RDE-Blagoevgrad, own calculations*

The results of the state qualifying exams also marked a slight change - from 4.72 for the 2019-2020 school year to 4.68 for the last school year.

4. Applicable regulatory framework in Bulgaria, related to the provision of education in an electronic environment and its specifics, affecting schools in the territory of the Blagoevgrad district

The normative framework in our country, regulating preschool and school education, includes a number of normative acts that underwent changes in 2020 in connection with the Covid-19 pandemic and, accordingly, the need to provide the necessary normative basis for conducting education in an electronic environment, namely :

- Law on preschool and school education
- Ordinance No. 5 of 03.06.2016 on preschool education
- Ordinance No. 10 of 01.09.2016 on organization of activities in school education
- Ordinance on inclusive education
- Ordinance on the financing of institutions in the preschool and school education system
- Ordinance No. 4 on rationing and payment of labor

First of all, in 2020, changes were approved in the main regulatory act - the Preschool and School Education Act for adaptation to the existing epidemic situation and the normative justification of distance learning in an electronic environment , as well as in Ordinance No. 5 / 03.06.2016 on preschool education and Ordinance No. 10 /0 1.09.2016 on the organization of activities in school education . In addition to regulating innovative forms of learning - distance learning in an electronic environment and synchronous distance learning in an electronic environment, tested during the state of emergency in 2020, the changes seek a balance between face-to-face and electronic learning, so that in a more to a large extent to motivate children's interest in learning and thus increase their educational interests.

Accordingly, distance learning in an electronic environment is defined as:

- Training that is carried out using the means of information and communication technologies, since the trainer and the trainees are not physically located in the same place
- Includes distance learning hours, self-study, ongoing feedback on learning outcomes and assessment
- It is carried out by the teachers within the agreed duration of their working hours, and the implementation of the norm of teaching work is regulated in the state educational standard for the norming and payment of labor

This is applicable in the following three cases:

- When, due to extraordinary circumstances, the current educational process at the school is suspended
- When a certain student cannot attend school due to health or other valid reasons, certified by a document
- In innovative schools as an element of innovation in terms of organization related to improving quality and increasing learning outcomes

The changes in the legislation were prompted by the extended period of time after March 13, 2020, when face-to-face education was suspended across the country due to Covid-19, but the changes also successfully address the disruptions to the learning process typical of each school year due to seasonal flu and other causes. Through the changes in the law, it becomes possible during interruptions of this kind to organize and conduct distance learning in an electronic environment using modern digital and information technologies. In addition, support is provided for the trainees for personal development, again remotely in an electronic environment.

The new texts allow for alternatives when the school cannot provide remote learning hours that include self-training, ongoing feedback on learning outcomes and assessment, and the main challenge is to provide the necessary electronic devices, both for teachers and a considerable number of students to ensure both equal access and quality of education.

In addition, amendments were made to ***the Ordinance on Inclusive Education*** , related to the new conditions of an epidemic situation. The changes provide an opportunity for additional learning within the framework of general personal development support for students absent for more than 10 days for valid reasons, and/or to compensate for the lack of teacher interaction with students who are learning asynchronously at a distance in an electronic environment. This supplement corresponds to the additional remuneration agreed in the collective labor agreement for additional training in the absence of more than 10 days. Accordingly, it is specified that "Additional training under para. 3 is carried out synchronously from a distance in an electronic environment through no less than 10 study hours per month, distributed among the study subjects depending on their share in the school curriculum".

In addition, the absences that are set during synchronous and asynchronous training in an electronic environment, as well as the overall process of conducting training in an electronic environment in the centers for special educational support, the conditions and procedures for providing support for personal development from a distance in an electronic environment are additionally regulated. environment.

The changes in ***the Ordinance on the financing of institutions in the system of preschool and school education*** refer, first of all, to synchronization with the pre-school training introduced by law from the age of four, such as the financing of the activities of pre-school education for children aged 4 in kindergartens and in schools with the standard for a child in compulsory preschool age, it is carried out from the beginning of the budget year following the decision of the municipal council. Secondly, changes address the funding of schools providing distance learning, with the school in which the student is enrolled transferring 75% of the student standard to the school providing the training, in proportion to the training time.

The other change is in determining the groups for distance learning, respectively, they can be from 15 to 30 students, and the specific number is determined by the director. Groups with less than the minimum number of students can be formed after the permission of the Minister. In the event of an emergency epidemic situation, however, the number of students in the groups for a full-day organization of the school day is given the opportunity to be changed, as it is smaller than the regulated one (30 students).

There are also changes in the conditions for state funding of private kindergartens, which is also in line with the mandatory pre-school training from the age of four. The changes correspond to the amendments to the Preschool and School Education Act and the requirements set by the introduction of emergency measures.

Ordinance No. 4 on rationing and payment of labor includes changes in the following main directions:

- The implementation of the norm of teaching work in the case of introduced distance learning in an electronic environment, respectively in synchronous and asynchronous learning in schools, as well as in kindergartens and in groups for compulsory preschool education in schools is regulated
- Changes in teaching employment are allowed after the beginning of the academic year, which are carried out in schools conducting distance learning under Art. 115a, para. 1, 3, 4 and 5 of the Preschool and School Education Act
- When determining the number of staff in schools conducting distance education, it is guaranteed that, in addition to the implementation of the activities under para. 1 and conducting training in groups formed by students from other schools
- An opportunity is given for additional labor remuneration - "for conducting additional training of students to compensate for the lack of interaction of the teacher with students who are trained asynchronously from a distance in an electronic environment under the conditions of Art. 115a, Para. 4 of the ZPUO.

In addition, PMS 290 of October 23, 2020 provides additional funding for activities under the National Program "Optimization of the School Network". The decree approved an additional 28,038,780 BGN, with the main part (24 million) allocated to the budgets of the municipalities, and the rest to the Ministry of Youth and Sports, the Ministry of Culture and the Ministry of Education. With the provision of these additional funds, the payment of benefits is guaranteed, especially that under Art. 222, para. 3 of the Labor Code for teachers and non-teaching staff in educational institutions.

5. Conclusions on the effects (effectiveness) of distance learning during the Covid-19 pandemic

In Bulgaria, the transition to online education in March 2020 happened urgently and in an extremely short time frame. Moreover, it happened successfully, thanks to the efforts of the teachers and the support of the school administration. This is clearly seen in the questionnaires of the students, who overwhelmingly express their positive assessment and give credit to their teachers for having managed to cope at such a high level under the new circumstances.

This success is even more significant considering the lack of prior preparation for e-learning, both by teachers and students (in contrast to countries such as Finland, where teachers have been purposefully trained for years, as and the experience of implementing a blended form of learning, where some days and periods are taught remotely, thanks to which all participants in the process have the necessary skills and attitudes and the transition to online learning happens routinely and without tension). This speaks to the efforts made and to the high adaptability of the teachers, where, among other things, online learning has significantly increased the daily workload in relation to the performance of their official duties. In fact, online learning "automatically" imposed a new type of commitments and responsibilities, significantly increased the demands on teachers from all sides - students, parents, the administration in the field of education and the whole society, without the necessary preparation for this and not always with the necessary technical support.

It is important to note the efforts of the administration at various levels in the field of education, which managed (to a large extent) to technically provide teachers with the necessary devices, to develop and provide guidelines for conducting training and, last but not least, to establish in the classrooms institutions of protocols to prevent infection with Covid -19 during on-site training.

However, teachers and students categorically express a preference for the present form of education, evaluating it as more effective in every aspect. At the same time, the application of distance learning in exceptional circumstances is not denied, when it provides the only alternative to not interrupting the learning process. The experience gained in the period 2020-2021 will allow in the future, in case of epidemics of seasonal flu, for example, not to waste learning time, which necessitates a subsequent restructuring of the material and its catch-up, which disrupts the normal learning rhythm of teachers and students, objectively reflects the effectiveness of training in such periods.

Teachers' and students' evaluations of online learning as a form of learning are overwhelmingly negative, but they concern aspects of its essence (including lack of contact with teachers and between students, reduced physical activity, limited extracurricular activities, etc.) and to a limited extent, they are due to the way in which this happened in Bulgaria in the observed period and, accordingly, its effectiveness.

As can be seen from the analysis of the educational results (grades) of the students in the same period and the comparison with similar data from previous periods, it can be seen that the effectiveness of online learning is high and the results are close to the results of previous school years, in which the learning was entirely present. This is also confirmed by the survey data, as both target groups – teachers and students share a similar opinion (Figures 18 and 19).

It is important to note once again the role of teachers in achieving this efficiency, because in the absence of prior preparation, adequate textbooks and other resources, often even technical provision - their personal approach, motivation and efforts determine the positive effect of the grade(s) taught.

However, better performance and higher impact should be sought in future online learning. This will happen by solving the main problems that are currently being identified. These

issues are now being addressed "on the fly" and are not having a significant impact yet, but with continued online learning, the negative effect of not addressing them will inevitably follow.

Therefore, in order to guarantee successful and effective online education in our country in the future, the following main problems must be urgently addressed:

1. A large proportion of students studied on a smartphone rather than a tablet or laptop (desktop computer)
2. There is a need for textbooks that are specifically designed for online learning, as well as other/diverse online resources including platforms, apps, videos, etc.
3. Teachers need to upgrade their skills specifically for teaching online, including for working with diverse resources and optimal use of the possibilities of educational platforms, in order to build an interactive online environment
4. The motivation of (part of) students is insufficient and decreasing with longer online learning
5. Insufficient involvement of (part of) parents and underestimation of their role in online learning conditions
6. Formed a negative attitude in society towards online learning

6. Presentation of good practices from at least 3 EU member states where distance learning measures for students have been implemented (are being implemented)

The selection of good practices that are presented in this report was made on the basis of information from a report by the Center for European Policy Studies [8]on the "Index of readiness for lifelong digital learning in the 27 countries of the European Union" based on a 2019 survey d. The Index presents a combined qualitative and quantitative assessment of the current situation of each Member State to help politicians, social partners, media and the public to identify precisely the measures and actions needed.

In this way, the following countries are ranked in the first five places: **Estonia** , the Netherlands, **Finland** , Luxembourg and Malta. This ranking is not surprising, in view of this northwest countries are prone to perform very well in various rankings, for example political institutions and economic performance.

Bulgaria is ranked 19th and accordingly has a better performance than countries such as Belgium (21st position), Poland (22nd), Czech Republic (23rd), Romania (24th), Greece (25), Italy (26th) and Germany – in the last 27th place.

6.1. Good practice in Estonia

Estonia is undoubtedly one of the most interesting and at the same time relevant examples of successfully implemented distance learning measures for students and for a number of other reasons. The country has a highly developed digital infrastructure, as 99% of households have a broadband Internet connection (in 2001, the country was one of the first in the world to affirm access to the Internet as a human right, and digitization is a national priority) . Moreover, the whole society is positive towards information technology as a part of everyday life in its various aspects. This includes the field of education, as the country has been preparing for years to switch to digital education.

Before the pandemic, most Estonian schools routinely used digital learning materials , and the training of teachers to teach in an electronic environment began nearly 10 years ago. They also have access to a wide range of online tools to connect students, teachers and parents (among them eKool, a school management network that has over 200,000 active users on a

[8] www.ceps.eu

typical day, and Stuudium, a suite of educational apps materials, assessment tools and messages). Even before the pandemic, a large part of education in Estonia is already in the "cloud" and 87% of schools use the mentioned tools for various purposes (e.g. for preparing lesson plans, assigning homework, managing absences and/or recording of grades).

All this allowed a relatively smooth transition to distance learning after March 2020, especially compared to other EU countries, and the difficulties that arose were addressed quickly and in a timely manner.

The main difficulty is the adaptation of the existing platforms to a 15-20 times higher load than usual, since they were not designed to completely replace classrooms. Accordingly, despite the preliminary preparation, additional resources (human, technical and financial) have to be constantly committed to ensure the process.

At the same time, there are teachers in the country who are not so well prepared for this situation and accordingly it requires them to adapt very quickly. For all of them who are experiencing any difficulties, help has been provided immediately through educational technology and the Educational Information Technology Foundation in the country, which has set up teacher support groups. In addition, teams of education technology specialists are based in schools and work with teachers to ensure the best use of digital resources.

Another problem, albeit on a small scale, is that not every child in Estonia has access to a laptop or tablet. The problem was solved with the cooperation of schools, local administrations and voluntary organizations, so it is reported that within the framework of distance learning, because of C ovid-19 since March. 2020 to date, school teachers have managed to reach almost all children [9].

The evaluations that Estonia receives from various sources, including external, show that the country has done exceptionally well in closing schools and moving fully to distance learning in 2020-2021 and show once again that it is establishing itself as Europe's new educational powerhouse, surpassing Finland. Moreover, these estimates place countries such as the UK and Germany far behind.

According to the head of education and skills at the Organization for Economic Co-operation and Development, Andreas Schleicher, the reasons why Estonia has made such a successful transition to distance learning is because "teachers and school leaders in Estonia are used to working as designers of innovative learning environments and have great flexibility about how best to configure people, spaces, technology and time in their respective contexts'.

In March 20202 Estonia, Finland, Denmark, Iceland, Latvia, Lithuania, Norway and Sweden share their digital educational tools for distance education and training, providing free access to them, to support the education systems of other countries during the COVID-19 crisis. These online tools are usually co-created between schools, universities and private companies. Many are suitable for international use and the companies that own them have agreed to make them available to assist other countries. These tools can help teachers and education administrators make distance learning more social and keep learners motivated—two key challenges in face-to-face and group learning. These tools are available through the following website: www.education-nation.99math.com . Some of these resources are presented in the following table:

[9] https://www.theguardian.com/world/2020/oct/30/lessons-from-estonia-why-excels-digital-learning-during-covid

Online tool	Short information	Intended for
Scoremusic www.scoremusic.me	Scoremusic was developed in Estonia as a freeware y digital sheet music server for musical instrument teachers and students. The electronic service enables the music teacher to share sheet music and annotations paperless within a closed system in real time. The student can use any digital device available in their home - computer, tablet or smartphone - to read , while having the possibility to project the notes from a digital device on a larger TV screen for better visibility. available in English.	Teachers: teachers of musical instruments Students, choirs, orchestras, ensembles
99math www.99math.com	99math is a fun way to practice math. While at home, students can come together virtually and improve their math skills while enjoying the feeling of play. 99math offers a solution to learning through play as students can compete with each other and feel connected with their friends. Available in several languages, including English, Spanish, Portuguese.	Students: primary and primary school Teachers: primary and primary school, mathematics Parents: of students from 1st to 8th grade
3D learning www.3dl.no www.facebook.com/ 3dlinternational	3DL is an app that can be downloaded by teachers and students from the Mac Store, Windows Store, Google Play and Appstore. It provides over 1000+ content elements - 3D models, videos and animations. Students and teachers can use it for learning and teaching. Users can make their own videos, answer quizzes and puzzles. Available in several languages, including English.	Students: all school levels Teachers: all school levels
BeED www.beed.world/news/ free-beed-coronavirus- support	BeED is a pedagogically focused platform designed to meet school curriculum and needs. Some of BeED's features include an experiential learning mobile app, a curriculum builder, and interactive mapping for an engaging and flexible learning experience. The mobile platform enables educators to move beyond the closed walls of schools to conduct lessons remotely, providing students with the support they need through continuous learning. Through their own mobile devices, students and teachers can continue with lessons,	Students: all school levels, colleges, universities or any educational institutions Teachers: schools, colleges, universities or other educational institutions

Online tool	Short information	Intended for
	assessment and personalized interaction, albeit from a distance. Available in English.	
Beetroot Academy beetroot.academy/en/	The online learning management system allows to easily manage the learning process in the school or organization. The teacher or administrator inserts the lesson content, homework, tests and opens the lesson for students to begin learning. Each individual student's learning can also be tracked so that extra help can be provided to those who need it. Available in several languages, including English and Russian.	Teachers and administrative staff: all levels Students: all levels
Big Ear Games www.biggeargames.com	A fun game/app to discover how music works and compose your own songs. It provides sharing capabilities that can be used at home and/or at school. The teacher can monitor and review shared songs. The teacher can offer tasks, challenges in the application. Any student can do it, not only students in music classes and schools. No musical instruments required. Available in English.	Students: all school levels Teachers: all school levels Parents: all school levels
Bit by Bit Bit by Bit rrrebane.github.io/BitByBit	Bit by Bit is a fun puzzle game, not just a learning tool - while playing it, children easily learn the basic concepts of programming and take their first steps in it. An open source coding learning game.	Students: elementary school
Clanbeat www.clanbeat.com	Clanbeat is a comprehensive growth support platform for people and communities in learning. Providing software for targeted engagement, community building, continuous development, culture and engagement among students and teachers.	Teachers: schools, colleges, universities or other educational institutions

Source: www.education-nation.99math.com

6.2. Good practice in Finland

Both international comparisons and national studies (including the National Education Agency of Finland [10]) show that the transition to and delivery of distance learning in Finnish schools and educational institutions has been very successful given the circumstances. Analogous to the case of Estonia, this is due to the high professional skills of teachers and society's investment in education and digitalization. The view that distance learning works well given the circumstances is supported by teachers, students and parents/guardians in a number of reports and studies.

Virtual learning environments are widely used in Finland, including in regular school settings. The National Education Agency of Finland guides schools to plan and organize different types of flexible learning environments. Some of the most commonly used tools where students can independently conduct projects and assignments and attend classes online are Moodle, Google Classrooms, Ville, Teams, O365, Skype and Zoom. Games and simulators are also already used in education, with examples such as VirtualAutoedU, Sandbox or DigiVirtu [11]. Another advantage of Finland, which further helped the introduction of online learning due to Covid-19, is the well-established practice of organizing communication between home and school through online platforms. These platforms are used to post student assignments, test scores, grades, and notes, to receive feedback between home and school, and they typically communicate with other school administrative information systems. The main platforms used for primary and secondary education are Helmi, Wilma (Primus), Studentaplus and Sopimuspro.

In the course of the pandemic and continuing distance education of students in 2020, serious efforts are directed at providing methodological and technical support for teachers, for which a number of instructions and recommendations have been developed and published. In addition, schools have been given some leeway in terms of spending needed to offset the impact of the emergency, and compensatory government transfers have been made for the continuing education of teachers and, for example, the development of different learning environments.

All primary education schools in Finland rely mainly on hardware and software provided by multinational ICT companies, with a large proportion of students having their own devices. However, there is a need to procure devices for some students and schools, and the problem has been resolved through a special campaign by the National Education Agency of Finland , entitled "Computers for All", in which companies donated second-hand computers to schools.

Conducted "Study on distance learning in Finland during the Covid -19 crisis" [12]identified as a weak point the ratio between lessons conducted synchronously and asynchronously, reporting that the share of the latter is too high. On this basis, it is considered that efforts should be made to increase and develop interaction in distance learning, giving students the opportunity to communicate and communicate more both with their teachers and with each other.

At the same time, the report notes that there was good communication through various channels, both with students and also with their parents. Instant messaging services such as WhatsApp were found to have played a crucial role in this communication, with around half of the teachers contacting their students daily during distance learning and almost all contacting their students at least once a week. Accordingly, not only telephones, but also the schools' electronic learning environment, as well as the widespread digital school administration and information system Wilma, have been used to keep in touch with families and students.

[10] www.oph.fi

[11] https://www.worldbank.org

[12] www.oph.fi

A number of different reports and preliminary studies have shown that while distance learning has been a positive experience for most students, it has also required support mechanisms and students must learn to work independently. For some children and youth with sensory hypersensitivity, neuropsychological spectrum diagnoses, and school anxiety, distance learning has proven to be an extremely positive experience.

6.3. Good practice in Portugal

In the study by the Center for European Policy Studies on the "Index of readiness for lifelong digital learning in the 27 countries of the European Union", Portugal was ranked 9th, showing better results than countries such as Austria, Denmark and France . This performance is more than good, considering the state of the national economy.

In fact, at the political level in the country there is a clear understanding of the role and importance of digital learning for improving the competitiveness of the national economy and achieving higher added value. For this purpose, an interdepartmental policy framework on digital skills (INCoDe.2030 [13]) has been adopted, which clearly defines the responsibilities and the way of financing to achieve the set quantitative goals of the policy for 2030. A special focus is placed on mass introduction of ICT in teaching and learning, with priority on primary and primary education.

In this context, before the outbreak of the Covid-19 epidemic, the following basis for the successful conduct of distance learning has already been laid in the country, which favors the transition to it in March 2020:

- Full integration of ICT into the national curriculum in primary and secondary education, as well as priority training for teachers
- Piloting pedagogical and assessment practices as universities share good practices for digital learning
- Updating and upgrading the digital literacy of the population as a key dimension of citizenship and inclusion (lifelong digital learning is included in the national strategy, for example through technology specialization courses)

An important step in this process is the implementation of the national project for curriculum autonomy and flexibility - PACF (Projeto de Autonomia e Flexibilidade Curricular [14]). In this way, Portuguese schools can voluntarily join it and benefit from a range of resources to manage the curriculum and integrate practices that promote better learning. Starting in 2016 with pilot testing in 10 schools, the project has since expanded to more than 200 schools.

The project relies on the idea that schools should be able to define part of the curriculum as a way to encourage learning innovation – by experimenting with new subjects, implementing new pedagogical approaches, as well as developing new assessment practices, including using digital technologies. All this aims to support the consistent application of the so-called "Proficiency profile of students by the end of compulsory education" by developing and implementing a new teaching approach.

The project successfully complements another national initiative to promote digital skills, including through digital education - the "Core Core Curriculum" for primary and secondary education (Aprendizagens Essenciais). The initiative was launched in 2017 to address the need

[13] www.erte.dge.mec.pt

[14] https://www.dge.mec.pt/autonomia-e-flexibilidade-curricular

for a curriculum update process. Its aim is to ensure the mastery of the main disciplinary disciplines, while at the same time providing the opportunity for interdisciplinary learning. Through it, ICT has become an integral part of the curriculum throughout the 12 years of compulsory education. In primary schools, ICT is mainly addressed by the national project "Introduction to Coding in Primary Schools - INCoDe.2030" (Iniciação à Programação no 1º ciclo). These projects are aimed at promoting [15]:

Development of digital educational resources for different levels of education and subjects;

- Teacher training in pre-school, primary and secondary education, with the participation of teachers in training centers and higher education
- Expansion and further development of the ICT curriculum
- Design and implementation of the subject "Information and Communication Technologies" in compulsory education
- Designing an ICT frame of reference for first-year students

Evaluations of the implementation of the pilot phase of the PACF project have been extremely positive, leading to the expansion of the scope and in the academic year 2018-2019, 85% of all schools have already been covered (bearing in mind that participation is voluntary). The inclusion of all schools in the country is expected in the short term, meaning that over 7,000 Portuguese primary and secondary schools will have the opportunity to test and implement PACF.

This previous experience of Portugal greatly facilitates the urgent shift to distance learning in the wake of the Covid-19 crisis. The main difficulty is access to good internet and the supply of devices (tablets and computers) to teachers and students. The problem was solved through cooperation at different levels. Schools, public and private organizations are partnering to provide laptops and Internet access to some disadvantaged students. Where this is not possible, with the assistance of the Post Office and the National Scout Group, a mechanism has been put in place to allow students who live far from schools or do not have access to the Internet to receive paper lessons and assignments from schools. The delivery of homework/tasks on paper to the students and their subsequent collection and return to the teachers are also organized [16].

At the same time, nearly 800 schools hosted children whose parents worked in mainstream social services, as well as providing nutritional support to disadvantaged students. In this period, schools strengthened their interaction with the Inclusion Resource Centers to ensure the continuity of their specialized student support services [17].

Teachers' associations and a number of scientific associations are involved in the production and sharing of pedagogical and didactic materials from the various disciplines of the national curriculum. Contacts with major publishers of educational content were also developed to expand the online resources available to teachers. A digital library model has also been developed where teachers can access and share content.

With the involvement of the Order of Portuguese Psychologists, guidelines for school psychologists and brochures for parents and students were produced and shared online, including:

- Self-care recommendations for early childhood teachers and educators
- Helping children cope with stress
- How to deal with an isolation situation

[15] www.ceps.eu

[16] Organization for Economic Development and Cooperation Strength Through Diversity Webinar October 5, 2020

[17] www.oecd.org

- How to explain social distancing and isolation measures to a child
- How to support distance learning, teaching and learning
- Families in isolation during the pandemic
- Learning in times of pandemic - a guide for parents and carers

7. Suggestions for increasing the effectiveness of online learning in the future when similar circumstances arise

The propositions that are defined in relation to increasing the effectiveness of online training in the future when similar circumstances arise are related to the main conclusions that were drawn from Bulgaria's experience in combination with the successful practices of EU countries, respectively adapted for implementation in our country. Accordingly, the recommendations are formulated in three main areas:

- Technical provision of online training for teachers and students;
- Technological and administrative provision of training in an electronic environment
- Improving attitudes about e-learning.

The first group of recommendations are basic and are aimed at providing the basis, the key prerequisite for conducting training in an electronic environment, in which all students will be covered, first of all, by ***providing the necessary technical devices*** - computers (including laptops) and /or tablets as a minimum. Next, the number of students and teachers using smartphones for online learning should be minimized. Providing the necessary number of technical devices and their allocation is a problem that should be addressed both at the national and local levels.

At the national level, the process has been launched through public procurement for the supply of equipment by the Ministry of Education and Science, with delivery and distribution pending before the start of the new academic year. In addition, local communities can be further activated through various ***mutual aid mechanisms*** (following the example of Estonia) so as to ensure the learning process in an electronic environment for every teacher and every student.

In addition, there is a need ***to develop textbooks and a variety of teaching aids specifically tailored to learning in an electronic environment.*** This particularly applies to subjects such as physical education, mathematics, music and fine arts, special disciplines in vocational high schools and natural sciences such as chemistry, biology, etc., in which teaching in an electronic environment is particularly difficult because of their specificity. In this sense, it is appropriate to provide access for the relevant teachers to resources, including foreign, but specially developed for the relevant needs (eg the BigEarGames application in Estonia, aimed at music education).

The next group of recommendations concerns the technological and administrative provision of learning in an electronic environment and can be considered as a set of a number of measures. First of all, it is ***training teachers to work with online learning platforms*** (not just basic use of Teams) so that they feel calm and confident during class hours. It is important that they know the functionalities of the system well, so that they can structure the lesson the way they want by using the different functions of the system - for example to group students to work in separate teams, to use a "blackboard", to screen sharing and also to enable/disable the "mute" of the teacher and/or other students etc. An important point in this training of teachers to work in an online environment is to form a positive attitude towards such kind of learning, so that they appreciate the advantages of such kind of innovative learning environment and the advantages it provides (following the example of Estonia).

This training will be supported by ***the development of various online resources*** to enrich the learning process and also to attract the attention of students, including in the form of various games. Accordingly, teachers should be given access and adequate training/instruction in their use to maximize the potential of these resources.

The development and introduction of an adequate support mechanism for teachers - support groups at the municipality level, which include various experts (including specialists in information technology, psychologists, etc.) to assist on a daily basis teachers during training in an online environment to solve current problems of a different nature. In addition, ***adequate instructions and guidelines for learning in an online environment should be developed and introduced*** , including specifically targeting individual subjects where teaching in an electronic environment is objectively more difficult.

Another group of measures is aimed at improving attitudes about learning in an electronic environment - among teachers, among students, among parents, among society as a whole through:

- ***Motivating teachers*** to create an interactive and diverse online learning environment
- ***Engaging parents*** , whose role during online learning significantly increases and objectively requires greater participation and follow-up, supporting the learning process by providing optimal conditions for learning (e.g. a quiet and peaceful place and atmosphere), exercising control and motivating children for active participation in the learning process
- ***Improving the motivation of students to learn*** by using the various functionalities of the educational platforms, by applying specially developed and specialized applications, including vida, games, etc. to attract and retain interest in the material being taught
- ***Improving the image of online learning in society*** to overcome the planted negative stereotype towards this type of learning and transforming it in a constructive direction towards providing the necessary support to increase its effectiveness
- ***Creating more opportunities for communication between the teacher and students, as well as between students*** - incl. Viber, WhatsUp, etc. – by applying an individual approach and contact with students. This aspect has been largely neglected in online learning to date, mostly due to prioritizing problems and solving the most urgent of them. In view of the predictions for the upcoming third school year in a row, in which online learning will be an integral part of the learning process, it is time to focus on this problem - the lack of opportunity for communication between students, as well as between students and their teachers in a form close to that of the classroom is already very sore. Accordingly, providing an opportunity for such communication will not only improve the effectiveness of learning, but also positively affect the emotional state of students - a problem whose effect is yet to be evaluated.

8. Sources of Information

- Regional Department of Education - Blagoevgrad
- project - www.intersycii.eu
- National Statistical Institute - www.nsi.bg
- Union of Bulgarian teachers - www.sbubg.info
- Institute for Research in Education - www.ire-bg.org
- Center for European Political Studies - www.ceps.eu

- Report on the "Index of readiness for lifelong digital learning in the 27 countries of the European Union" of the Center for European Political Studies
- Organization for Economic Cooperation and Development - www.oecd.org
- National Education Agency of Finland - www.oph.fi
- "Study on distance learning in Finland during the COVID-19 crisis" of the National Education Agency of Finland
- General Directorate of Education of Portugal - https://www.dge.mec.pt/autonomia-e-flexibilidade-curricular
- www.erte.dge.mec.pt
- Report " The impact of COVID-19 on student equity and inclusion: supporting vulnerable students during school closures and reopenings" by the Organization for Economic Development and Cooperation (OECD), www.oecd.org
- Organization for Economic Development and Cooperation Strength Through Diversity Webinar, 5 October 2020 , www.oecd.org
- Law on preschool and school education
- Ordinance No. 5 of 03.06.2016 on preschool education
- Ordinance No. 10 of 1.09.2016 on the organization of activities in school education
- Ordinance on inclusive education
- Ordinance on the financing of institutions in the preschool and school education system
- Ordinance No. 4 on rationing and payment of labor

9. Annexes

- Annex №1. Questionnaire for teachers
- Annex №2. Survey card for students

Приложение №1. Анкетна карта за учители

Уважаеми учители,

Регионално управление на образованието – Благоевград изпълнява проект "Интегрирани териториални синергии за детско здраве и защита II" (INTERSYC II), финансиран по Програмата за трансгранично сътрудничество ИНТЕРРЕГ V-A "Гърция – България 2014 – 2020 г.". В рамките на проекта е предвидено проучване на ефектите от дистанционното обучение по време на пандемията от Covid-19 и даване на предложения за ефективно онлайн обучение в бъдеще при подобни обстоятелства.

С попълването на настоящата анкета ще ни дадете възможност да разберем Вашата гледна точка относно положителните и отрицателните ефекти от дистанционното обучение на територията на област Благоевград.

1. На кой клас преподавате?

☐ 1 – 4 клас
☐ 5 – 7 клас
☐ 8 – 10 клас
☐ 11 – 12 клас

2. Смятате ли, че онлайн обучението е по-ефективно в сравнение с традиционното присъствено обучение?

☐ Да
☐ Не
☐ Не мога да преценя

3. Имахте ли предварителна подготовка (напр. в курс по професионална квалификация или друг) относно спецификите на преподаването онлайн?

☐ Да
☐ Не

4. Получихте ли инструкции (напр. от страна на училищното ръководство) относно методиката за преподаването онлайн преди да започнете дистанционното обучение?

☐ Да
☐ Да, но недостатъчно изчерпателни и/или навременни
☐ Не

5. На какво техническо устройство преподавахте основно онлайн?

☐ Стационарен компютър
☐ Лаптоп
☐ Таблет
☐ Смартфон (телефон)

6. Собствено техническо устройство ли използвахте за преподаването онлайн или такова, предоставено от училището?

☐ Собствено
☐ Предоставено от приятели или роднини
☐ Предоставено от училището

Този документ е създаден в рамките на договор № B2.9a.03 "Интегрирани териториални синергии за детско здраве и защита II" (INTERSYC II), финансиран по Програмата за сътрудничество ИНТЕРРЕГ V-A "Гърция-България 2014-2020", съфинансирана от ЕФРР и националния бюджет на участващите страни. Цялата отговорност за съдържанието на настоящия документ е на РУО – Благоевград и при никакви обстоятелства не може да се счита, че отразява официалното становище на Европейския съюз, на участващите държави, на Управляващия орган и на Съвместния секретариат.

7. Имахте ли технически проблеми с устройството по време на преподаването онлайн?

☐ Не, нямах проблеми
☐ Да, понякога
☐ Да, твърде често
☐ Постоянно имах проблеми

8. Имахте ли проблеми с достъпа до интернет по време на преподаването онлайн?

☐ Не, нямах проблеми
☐ Да, понякога
☐ Да, твърде често
☐ Постоянно имах проблеми

9. Какво Ви затрудни най-много по време на преподаването онлайн?

☐ Липсата на директен визуален контакт с учениците
☐ Недостатъчното време за преподаване и/или изпитване при съкратени учебни занятия онлайн
☐ Невъзможността да контролирам присъствието им по време на часовете
☐ Нежеланието на учениците активно да участват в обучителния процес
☐ Провеждането на тестове
☐ Техническата ми осигуреност/достъпа до интернет
☐ Друго (моля, посочете): ……..

10. Кои предмети, според Вас, се преподават най-трудно онлайн?

☐ Физическо възпитание и спорт
☐ Музика и изобразително изкуство
☐ Природни науки (напр. химия, физика, биология)
☐ География и история
☐ Математика
☐ Български език и литература
☐ Философия и гражданско образование
☐ Информатика и информационни технологии
☐ Технологии и предприемачество
☐ Чужд език (напр. английски, немски и т.н.)
☐ Специални дисциплини в професионалните гимназии
☐ Друго (моля, посочете): ……..

11. Доколко успешно учениците се справиха с усвояването на учебния материал?

☐ Отлично
☐ Много добре
☐ Добре
☐ Слабо
☐ Не мога да преценя

Този документ е създаден в рамките на договор № B2.9a.03 "Интегрирани териториални синергии за детско здраве и защита II" (INTERSYC II), финансиран по Програмата за сътрудничество ИНТЕРРЕГ V-A "Гърция-България 2014-2020", съфинансирана от ЕФРР и националния бюджет на участващите страни. Цялата отговорност за съдържанието на настоящия документ е на РУО – Благоевград и при никакви обстоятелства не може да се счита, че отразява официалното становище на Европейския съюз, на участващите държави, на Управляващия орган и на Съвместния секретариат.

12. Какво, според Вас, затрудни най-много учениците по време на онлайн обучението при усвояването на учебния материал?

☐ Липсата на възможност за директна комуникация с учителите
☐ Липсата на достъп до консултации по учебния материал
☐ Липсата на мотивация от страна на учениците
☐ Учебниците не са пригодени за онлайн преподаване
☐ Трудните условия за обособяване на индивидуално учебно пространство вкъщи
☐ Технически проблеми, свързани с мобилните устройства или достъпа да интернет
☐ Друго (моля, посочете): …….

13. Според Вас, каква беше дисциплината на учениците по време на онлайн обучението в сравнение с присъственото обучение?

☐ По-добра
☐ Нямаше промяна
☐ По-лоша

14. Смятате ли, че онлайн обучението подобри Вашите качества като преподавател?

☐ Да, в голяма степен
☐ Да, в известна степен
☐ По-скоро не
☐ Не
☐ Не мога да преценя

15. Във Вашето училище прилага ли се утвърден протокол (метод, система, последователност от действия) за предпазване от заразяване с Ковид-19 по време на присъствено обучение?

☐ Да
☐ Не
☐ Не знам

16. Ако имахте избор, в бъдеще кой метод на преподаване бихте предпочели?

☐ Онлайн
☐ Присъствено в класна стая (в училище)
☐ Комбинирана форма чрез редуване на онлайн и присъствено обучение

17. Ако се прилага комбинирана форма (редуване на онлайн и присъствено обучение), каква според Вас трябва да е максималната продължителност на един период обучение онлайн, за да се запази качеството на преподаването, съответно на усвояването на учебния материал от страна на учениците?

☐ До 2 седмици обучение онлайн
☐ До 1 месец обучение онлайн
☐ До 3 месеца обучение онлайн
☐ Друго (моля, посочете): …….

18. Какви препоръки бихте дали за подобряване на онлайн обучението в бъдеще?

……

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Приложение №2. Анкетна карта за ученици

Драги ученици,

Регионално управление на образованието – Благоевград изпълнява проект "Интегрирани териториални синергии за детско здраве и защита II" (INTERSYC II), финансиран по Програмата за трансгранично сътрудничество ИНТЕРРЕГ V-A "Гърция – България 2014 – 2020 г.". В рамките на проекта е предвидено проучване на ефектите от дистанционното обучение по време на пандемията от Covid-19 и даване на предложения за ефективно онлайн обучение в бъдеще при подобни обстоятелства.

С попълването на настоящата анкета ще ни дадете възможност да разберем Вашата гледна точка относно положителните и отрицателните ефекти от дистанционното обучение на територията на област Благоевград.

1. В кой клас сте?

☐ 1 – 4 клас
☐ 5 – 7 клас
☐ 8 – 10 клас
☐ 11 – 12 клас

2. Преди началото на дистанционното обучение, наложено от пандемията от Ковид-19, участвали ли сте в други онлайн обучителни извънкласни форми (напр. в онлайн курсове и др.)?

☐ Да
☐ Не

3. Какви са основните ползи от онлайн обучението за Вас?

☐ Имам повече достъп до онлайн обучителни материали (напр. презентации, видеофилми и др.)
☐ Спестявам време за отиване и връщане от училище
☐ Научавам по-добре учебния материал
☐ Имам повече свободно време
☐ По-удобно ми е да уча от вкъщи
☐ Нямам конфликти със съучениците си
☐ Друго (моля, посочете): ……..

4. Кои, според Вас, са основните недостатъци на онлайн обучението?

☐ Не мога да общувам или играя със съучениците си
☐ Трудно ми е да възприемам материала, когато се преподава онлайн
☐ Постоянно имам технически проблеми с устройството за онлайн обучение (напр. компютър, таблет)
☐ Неудобно ми е да уча от вкъщи (напр. нямам отделна стая за учене, домашните ми постоянно вдигат шум и т.н.)
☐ Трудно ми е да спазвам разписанието на часовете
☐ Липсва ми физическата активност
☐ Ограничена е извънкласната ми дейност (напр. курсове, олимпиади, екскурзии и др.)
☐ Друго (моля, посочете): ……..

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5. На какво техническо устройство провеждахте основно онлайн обучението?

☐ Стационарен компютър
☐ Лаптоп
☐ Таблет
☐ Смартфон (телефон)

6. Имахте ли технически проблеми с устройството по време на онлайн обучението?

☐ Не, нямах проблеми
☐ Да, понякога
☐ Да, твърде често
☐ Постоянно имах проблеми

7. Имахте ли проблеми с достъпа до интернет по време на онлайн обучението?

☐ Не, нямах проблеми
☐ Да, понякога
☐ Да, твърде често
☐ Постоянно имах проблеми

8. Имахте ли обособено място у дома (напр. отделна стая, отделно бюро), където да учите?

☐ Да
☐ Не

9. Семейството Ви осигури ли Ви достатъчно тишина и спокойствие, докато учехте вкъщи?

☐ Да
☐ Не

10. В каква степен смятате, че учителите Ви се справиха успешно с преподаването на учебния материал?

☐ Отлично
☐ Много добре
☐ Добре
☐ Слабо
☐ Не мога да преценя

11. Как се справихте с усвояването на учебния материал по време на онлайн обучението?

☐ Имам по-високи оценки спрямо периода на присъственото обучение
☐ Няма промяна в оценките ми в сравнение с получените по време на присъственото обучение
☐ Имам по-ниски оценки спрямо периода на присъственото обучение

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12. Какви са основните слабости, които смятате, че са допуснали Вашите учители по време на онлайн обучението?

☐ Преподаваха твърде бързо или твърде неясно учебния материал
☐ Не използваха достатъчно онлайн презентационни материали (напр. презентации, видеофилми и др.)
☐ Нямаше възможност за консултации по учебния материал
☐ Нямаше достатъчно време за даване на отговори на въпросите по време на тестовете
☐ Нямаше достатъчно време за устно изпитване
☐ Часовете бяха съкратени
☐ Друго (моля, посочете): …….

13. Ако имахте избор, в бъдеще кой метод на учене бихте предпочели?

☐ Онлайн обучение
☐ Присъствено обучение в класна стая (в училище)
☐ Комбинирана форма чрез редуване на онлайн и присъствено обучение

14. Какви препоръки бихте дали на учителите си за подобряване на онлайн обучението в бъдеще?

.....

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