High School Education during the COVID-19 Pandemic

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Abstract: The coronavirus infection originated in Wuhan, China, and soon spread around the world. The declared COVID-19 pandemic has affected almost all aspects of modern society. This paper examines the impact of the COVID-19 pandemic on secondary education and student achievement in the state graduation exam. Secondary education of the students in Croatia has adapted to the new situation with the school closure, online teaching and with the adaptation of teaching methods. The purpose of the state graduation exam is to assess and evaluate the achieved knowledge and competences, acquired by education in accordance with general education teaching plans and programmes. For this reason, in this research, an analysis of student performance in the state graduation exam was conducted. The results of the exam of the compulsory part of the state graduation exam in the summer exam period from the school year 2012/2013 until 2020/2021 were observed. In this paper, the impact of the COVID-19 pandemic on secondary education was examined from several different aspects. According to the analyzed indicators, the results showed that there is no significant decline in the successful adoption of teaching materials, i.e. there is no reduction in the number of students who successfully passed the state graduation exam. Furthermore, the share of students who passed the state graduation exam within sufficient grades was analyzed, and the results showed that there is no major decline. Lastly, the share of students who passed the state graduation exam and enrolled in some form of higher education was analyzed. The results showed that the number of students who enrolled in some of the study programs of higher education institutions did not decrease.

1. INTRODUCTION

At the time when COVID-19 disease appeared in Wuhan, China, no one knew how much the disease would affect the lives of all people around the Earth. “COVID-19 is a disease caused by a coronavirus, and it has been named a new type of coronavirus 2019-nCoV” (Bender, 2020). The first infected people appeared in December 2019, and within a few months the infection spread around the world, and on March 11, 2020, the World Health Organization (WHO) declared a pandemic. According to Yan (2020), the scale of the pandemic is indicated by the fact that this pandemic is “comparable in its wide scope and impact with World War II or the Great Depression”. Among the different types of influences on public health, economic, political, educational and many other sectors of modern society, one unique influence stands out and that is maintaining a physical distance. Consequently, different types of human social interactions (shopping, banking, education, business meetings and entertainment) moved from dominantly offline to dominantly online (Yan, 2020). According to UNESCO (2020), “in April 2020, 91.3% of students in 188 countries were affected by changes in schooling due to the spread of COVID-19 disease.”
The outbreak of the COVID-19 pandemic affected all segments of education, primary, secondary and higher education. Many countries have closed schools and colleges due to the COVID-19 pandemic. “Mathematical models and empirical analyses of reactive closures in past pandemics show that closing schools reduces the total number of cases in the community by about 25 percent and postpones the peak of the pandemic by a week or two, which is helpful” (Christakis and Christakis, 2020).

Figure 1 shows how many weeks the schools were closed in certain countries of the world. The Republic of Croatia completely closed schools for 10 weeks for all students, after which it opened only for students from 1st to 4th grade of primary school.

The education system had to adapt very quickly to the current situation, so teaching methods changed. Measures introduced to prevent the spread of the infection had an impact on the implementation and organization of classes. Classes were organized through various platforms where online teaching methodology was adopted, and the most commonly used were Zoom, Meet, MS Teams, Yammer and others. Students were isolated from their usual surroundings, separated from society and forced to stay at home and attend classes. The success of these adjustments, with a certain margin, can be assessed based on the results of the exams that students write at the end of a certain level of education. The results of the state graduation exam in the Republic of Croatia can be a good indicator of the success of the adjustment of the secondary school system.

This paper is divided into four chapters. In the first chapter, introductory considerations are given and the research problem is described. The second chapter describes the system of secondary education in the Republic of Croatia with special emphasis on the procedure of conducting the state graduation exam. The third chapter presents the results of the analysis of the performance of high school students according to various indicators. In the fourth chapter, concluding remarks are given.
2. HIGH SCHOOL EDUCATION IN THE REPUBLIC OF CROATIA

Secondary education in the Republic of Croatia is not compulsory. Secondary schools, according to the type of educational program, are divided into general education, vocational and art schools. Secondary education lasts mostly four years, while some programs last three and some five years. Students of four-year and five-year vocational programs complete their secondary education by defending their final thesis, while general-education high school programs with passed exams are an obligatory part of the state graduation exam. The state graduation exams are conducted at the same time with the same conditions and criteria for all students who take the state graduation exams in the Republic of Croatia. After graduating from high school, and based on their success in the state graduation exams, students enroll in higher education. In addition to the state graduation exams, some study programs also organize additional tests of knowledge and skills.

The state graduation exam in the Republic of Croatia is conducted by the National Center for External Evaluation of Education in cooperation with secondary schools and examination coordinators and other institutions involved in the implementation of the state graduation exam. The state graduation exam is conducted in the summer and autumn exams period. The Ordinance on taking the state graduation exam prescribes the content, conditions, manner and procedure of taking the state graduation exam, and all students for the state graduation exam are obliged to adhere to the ordinance.

The state graduation exams are exams in general education subjects and consist of two parts: obligatory exams and elective exams. The obligatory part of exams is from general education subjects: Croatian language, Mathematics and foreign language. Obligatory exams can be taken at one of two levels: higher (A) or basic (B). The higher (A) level of the exam is aligned with the curriculum for general-education schools, and the basic (B) level of the exam is aligned with the curriculum with the lowest hourly rate in four-year vocational schools. In the elective part of the state graduation exam, students choose the subjects they will take, with a maximum of six elective subjects in one exam period.

3. ANALYSIS OF THE SUCCESS OF SECONDARY EDUCATION DURING THE COVID-19 PANDEMIC

Changes in the education system have also been analyzed by the scientific community. For example, Sintema (2020) analyzed the situation in Zambia, Bao (2020) analyzed the University of Beijing, Toquero (2020) for the Philippines, and Tarkar (2020) for India. The impact of the COVID-19 pandemic on higher education in the world has been analyzed by Marinoni, van't Land and Jensen (2020) and Schleicher (2020), Onyema, Eucheria, Obafemi and others (2020). An analysis of recent scientific literature has shown that a relatively small number of studies have analyzed the impact of the COVID-19 pandemic on the education system, and especially a small number have analyzed the relationship between the COVID-19 pandemic and the education system in the Republic of Croatia. A common conclusion of the analyzed recent scientific literature is that COVID-19 has detrimental effects on education. The introduced measures reduced or prevented access to educational and research institutions and negatively affected job losses. Moreover, the teaching staff was forced to rely on technology to ensure continuous online learning during the coronavirus pandemic. This is where the IT competencies of teachers and students came to the fore. Also, there were problems with poor infrastructure and network capacity, unavailability of IT equipment and similar problems.
The state graduation exam can be a good indicator of the acquired knowledge of students and the success of the teaching process. Therefore, in this research, an analysis of student performance in the state graduation exam was conducted. In this paper, the results of the obligatory part of the state graduation exam in the summer exam period from the school year 2012/2013 until 2020/2021 are observed. The English language exam was viewed as a foreign language exam. The average grades on the state graduation exams were analyzed. After that, some other indicators were analyzed.

Analyzing Figure 2, there is no particularly dramatic drop in the average grades in the obligatory part of the state graduation exam. Some grades have even increased in the two years of the pandemic (2019/2020 and 2020/2021), such as Croatian A level, English B level, Mathematics A and B level. If we look at Figures 3 and 4 where student achievement is divided into general-education schools and vocational schools, the results again do not indicate a decline in student achievement in the state graduation exam.

Furthermore, the share of students who passed the state graduation exam with insufficient success in subjects and levels was analyzed (Figure 5). The results showed that no major decline was recorded, there is no difference in terms of levels.
Figure 4. Average grade on the state graduation exam – vocational schools


Figure 5. Shares of insufficient grades in the total number of grades - state graduation in the Republic of Croatia


Figure 6. Shares of students enrolled in higher education institutions by type of secondary school program and by type of enrolled higher education institution

The results of the success of secondary education have an impact on higher education. The share of students who passed the state graduation exam and enrolled in some form of higher education (professional and university studies) was also analyzed.

The results showed that there is no difference in the shares of insufficient grades in the total number of graded students at the state graduation exam, neither in general-education schools nor in vocational schools before and during the COVID-19 pandemic. If we look at the share of students who enrolled in any professional or university study in the total number of students who took the state graduation exam, there is no difference in the period before and during the COVID-19 pandemic.

4. CONCLUSION

The outbreak of the COVID-19 pandemic affected all segments of education, primary, secondary, and higher education. Many countries closed schools and colleges to fight the COVID-19 pandemic. Students had to adjust to the fact that they were instantly isolated from their usual school environments and get used to classes online. Teachers had to adjust their working methods, overcome information barriers and design adequate content in a very short time. In this paper, the impact of the COVID-19 pandemic on success in secondary and higher education is examined, and the success criterion is the success in the state graduation exam and the success of enrollment in some of the higher education institutions in the Republic of Croatia. The results showed that in comparison with the school and academic years before the pandemic, there was no significant drop in the average grades on the state graduation exam. Also, the success of enrollment in higher education did not decline.

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