



**Serbian Chemical Society– SCS**

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## **Serbian Chemical Society Annual Report to the EuChemS Division of Chemical Education for 2020-2021<sup>1</sup>**

### **1. Abstract**

The scientific conferences, in-service chemistry teachers training, chemistry competitions of primary and secondary school students were planned by the SCS Division of Chemical Education during the period from June 2020 to May 2021, but some of them have been postponed because of COVID-19 pandemic. Chemistry education at all levels in 2020/21 school year was being organized in combination of online teaching and teaching in classroom in dependence of current epidemiological situation in the country. Two journals, the Chemical Review and the Journal of the Serbian Chemical Society were published regularly.

### **2. National educational policy**

During the previous year the new curricula for the second grade of specialized grammar schools for physics and mathematics were prepared. In addition, during the autumn of 2020, the realisation of new project related to the revision of standards of students' achievement for the end of primary and general secondary education was started.

### **3. Events in chemical education**

In the period from June 2020 to May 2021 the Serbian Chemical Society planned several events:

- (a) **The April days on chemistry teaching - the 31<sup>th</sup> national meeting of chemistry teachers and the 4<sup>rd</sup> Conference of Chemistry Didactics** was initially planned for 24-25 April 2020, but it was postponed because of COVID-19 pandemic for the April of 2021. However, the epidemiological situation in the spring of this year did not allow organisation of this event and it was again postponed. The new date will be announced based on the epidemiological situation in the country in the new school year.

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<sup>1</sup>June 2020-May 2021, all levels of chemistry education: primary, secondary schools, universities, LLL, general and vocational education.

- (b) **57<sup>th</sup> Meeting of the Serbian Chemical Society - traditional conference of chemists of Serbia** was initially planned for 2-3 October 2020 in live contact, but it was postponed for 18-19 June 2021 in online environment.
- (c) **The primary and secondary school students' competitions in chemistry.** The Serbian Chemical Society, with support of the Ministry of Education, Science and Technological Development of the Republic of Serbia in the 2020/21 school year organized and realized all levels of the chemistry competitions for primary and secondary school students. In the 52<sup>nd</sup> International Chemistry Olympiad (23 - 29 July 2020), which was held online, the Serbian students received three silver medals and one bronze medal. The Serbian students received the same number of medals (three silver and one bronze) at the 55<sup>th</sup> International Mendeleev Chemistry Olympiad, which was also organized online (20 - 26 April 2021).

#### 4. Chemistry education during COVID-19 pandemic

- (a) **Classes in primary schools** in the school year 2020/21 were mostly organized as a combination of face-to-face and online instruction, and for two months only as online instruction. The duration of classroom period for face-to-face instruction was 30 minutes and for online instruction 45 minutes. Chemistry is taught in the seventh and the eighth grade of primary school (13- and 14-year-olds). During this school year, the challenge was to work with students who have just started studying chemistry, as well as with the eighth grade students who studied chemistry in regular circumstances during only one semester in the previous year. Teachers used different materials and platforms for online teaching. At the beginning of the pandemic the public broadcasting service of Serbia (RTS) organized recording of lectures and these records were emitted on national television and stored on the platform RTS Planet. Additionally, teachers organized own lectures through different platforms, such as Google classroom, Zoom... In this way, they provided students with different materials for online learning. According to teachers' experience half of the primary school students had responsible approach towards online teaching, while half of them perceived this kind of work as extended holiday. Primary school teachers conducted formative assessments and evaluated various student activities. However, they faced the problem to conduct summative assessment. Finally, they said that the final marks are almost the same as in previous years, but the students' achievements are significantly lower.
- (b) **In grammar schools** a combined method of classes organization was applied, which meant that students take turns in school every other week. While one group was at school, the other was at home and learning online. Additionally, slightly more than two months the teaching was performed only online. The classroom periods were in duration of 30 minutes. Teachers provided various materials for online learning (recorded classes on RTS Planet, ppt presentations, online resources...). According to the recommendation of the Ministry of Education, Science and Technological Development of the Republic of Serbia at the beginning of the school year a reduction of the materials in global plans was made (for example topics such as Industrial processes and Inorganic pollutants in the second grade and Nucleic acids, Basics of metabolism, Chemical aspects of environmental

pollution in the fourth grade are reduced). A criterion for contents reduction was that these contents are taught in the framework of some other topics or subjects. Based on this it could be said that majority of schools realized the curricular topics, but the main problem is associated with the realization of outcomes. Laboratory exercises were realized in grammar schools and they were beyond online world. Teachers evaluated the students' knowledge during pandemic as lower than before and said that final marks did not correspond to the real state. They indicated a problem of objective evaluation in online teaching as one of the main challenges with which they were faced. The other challenges were how to motivate students to learn in online environment and maintain their work habits, and also how to overcome absence of the live contact with students. On the other side, teachers recognized some benefits of online teaching. For example, they like recording of lectures, because student can later replay recorded video, stop it in some important places and make own dynamic for learning. Teachers also said that they discovered very useful online resources about which they had not known before. They also recommended online teaching as additional in the future.

- (c) **At the faculties**, specifically at the University of Belgrade - Faculty of Chemistry, every semester of the school year 2020/21 was divided into two parts - one for online lectures and the other for laboratory exercises in live contact with students. In accordance with epidemiological situation, autumn semester started with laboratory exercise and continued with online lectures. During spring semester the situation was opposite; at the beginning of semester online lectures were conducted and after that laboratory exercises. Ms Teams was used as a platform for online teaching, while exams are organized in the Faculty's building.

## 5. Publications

During the period from June 2020 to May 2021 the Serbian Chemical Society published two journals – the *Chemical Review* and the *Journal of the Serbian Chemical Society*.

The *Journal of the Serbian Chemical Society* (JSCS) publishes original papers from the fields of fundamental and applied chemistry: Theoretical Chemistry, Organic Chemistry, Biochemistry and Biotechnology, Food Chemistry, Technology and Engineering, Inorganic Chemistry, Polymers, Analytical Chemistry, Physical Chemistry, Spectroscopy, Electrochemistry, Thermodynamics, Chemical Engineering, Textile Engineering, Materials, Ceramics, Metallurgy, Geochemistry, Environmental Chemistry, **History of and Education in Chemistry** (<http://www.shd.org.rs/JSCS/>).

The *Chemical Review* is dedicated to chemistry teachers and students <http://hp.ratkovicdesign.net/home.htm>.

## 6. Name of delegate and deputy

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