



A Perspective on Chemistry and Society

A Column on the Occasion of the 75th Anniversary of CHIMIA

The Division of Chemical Education of the Swiss Chemical Society

The Division of Chemical Education Supporting Teachers throughout Switzerland

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Jan Cvengros was born in Slovakia and studied organic chemistry at Comenius University in Bratislava and completed his PhD thesis in organic chemistry at University of Cologne (Prof. H.-G. Schmalz). After postdoctoral stints at University of Milan (Prof. C. Gennari) and at ETH Zurich (Prof. Antonio Togni)

and a short employment as a process chemist at Syngenta, he established an independent research as an SNSF Ambizione fellow. His interests gradually shifted towards teaching leading him to his current position as a lecturer at ETH Zurich. In 2020 he became the president of the Division of Chemical Education of the Swiss Chemical Society.

Switzerland might be known for cheese, chocolate or watches, but chemistry is certainly, albeit not obviously, contributing to the positive reputation of this country. It is only seldom recognized by people that a broad palette of Swiss chemical companies, some of them worldwide leaders, specialize in a variety of fields and offer products and solutions for a broad community.^[1] Similarly, numerous research groups at Swiss universities and institutes develop innovative ideas in basic and applied chemistry leading to valuable results of wide interest. Eight Nobel prizes were awarded to Swiss chemists so far, three of them in the last 30 years. Such endeavours would certainly not be possible without a quality education and training. The efforts and the dedication of all teachers, lecturers or mentors are thus highly appreciated. Interestingly, unlike in a variety of European countries, *chemical education* as the study of teaching and learning chemistry in a coordinated and structured manner receives in Switzerland much less attention than expected.^[2] This statement should not degrade the efforts of the individuals but rather point to the fact that academic positions dedicated to chemical education are in Switzerland basically non-existent. Furthermore, a Division, which would focus on this matter, has been only relatively recently added to the portfolio of the Swiss Chemical Society.^[3]

Division of Chemical Education

The importance of such a division was recognized by Antonio Togni, Markus Müller, and Hans Peter Lüthi from ETH Zurich and following their initiative, the Swiss Chemical Society established the Division of Chemical Education (DCE) in April 2017. Right from the outset the activities were aimed at establishing a platform for the exchange of educational know-how at all levels (horizontal integration) and also between educational levels (vertical integration). An essential task was to identify suitable and dedicated individuals across Switzerland active in different fields related to chemical education. The first impression that this may include high school chemistry teachers

and lecturers at universities only is quite inaccurate. To a certain extent, it was rather unexpected even for the board members to witness, how broad the network could be, once we cast our net wide. Accordingly, it was just recently that the composition of the Board of the Division was finalized.^[4] The members representing high schools, secondary schools with vocational training, universities and universities of applied sciences stem basically from every corner of Switzerland. We hope that with such a broad coverage we will be able to address a vast majority of those dealing with chemical education. Albeit four years may seem to be a rather long period, the Division of Chemical Education is still young and we intensively work on identifying, establishing and developing the future ventures. It is important to stress that we are aware of a variety of activities offered by the independent associations (e.g. Zentralkürse organized by the Swiss-German Committee on Chemistry^[5]) and the Division has absolutely no intention of competing for the same audience. Our goal is to support and to contribute to any event aimed at improving chemical education or promoting chemistry. The symposia organized by the Division will primarily focus on filling thematic gaps not covered by others.



Professor Antonio Togni, one of the initiators and first president of the Division of Chemical Education, during a presentation at the 'Future of Chemical Education' symposium, 2019.

We would like to also encourage any individuals, schools or institutes to approach the Division of Chemical Education, if they feel that we might be the right partner for their endeavors. Recently, we have been contacted by the organizers of the Chemistry Olympiad (a chemistry competition mainly for high school students), who seek opportunities to promote this event between students and teachers.^[6] The Board of the Division discussed our possible involvement in this matter and agreed to use our communication channels to advertise the abovementioned contest. The Division will also help to find volunteers willing to mentor the students, especially as the International Chemistry Olympiad in 2023 will take place at ETH Zurich.^[7]

Chemistry Education and COVID-19

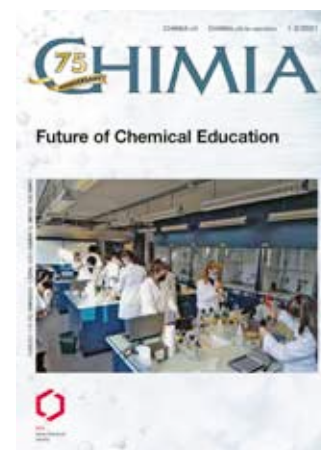
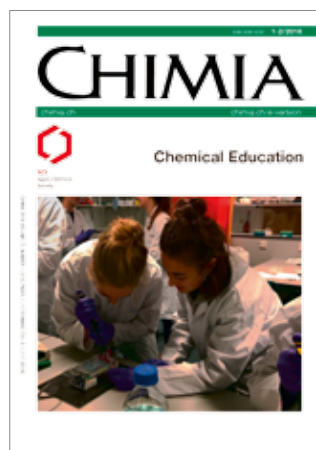
The events organized by the division were collectively entitled 'Future of Chemical Education', whereas the word future was intended to illustrate our intention to constantly contribute to the improvement of the teaching process, *e.g.* by introducing new methods or technologies. In other words, we offered a glimpse at how teaching chemistry might look in the future. Back in 2019 when initiating the first steps towards the next 'Future of Chemical Education' event we had no clue how close the future is and that these efforts may actually help to sustain the teaching and enable further education without calling off lectures, skipping the exams or even cancelling the entire school year during the corona pandemic.

The leitmotif of the symposium focused on problems and challenges related to teaching chemistry for a large and typically very heterogeneous body of students in the first year at the universities. The event was originally scheduled to take place in August 2020 in Muttens, but for obvious reasons it was rescheduled to April 2021. Although, to our dismay, traditional personal encounters were still not possible, the online symposium turned out to be a motivating and stimulating event. Speakers primarily described their strategies, how they deal with a task that is already quite difficult and demanding, yet their abilities were challenged even more in the last year. The sudden change in the teaching process forced the lecturers to find alternative solutions – solutions, which were maybe foreseen for the future but had to be applied almost immediately. Certainly, a further optimization is still necessary in many cases, but obviously this challenging situation prompted all of us to modify our teaching methods – something we probably wouldn't have done under normal circumstances. There is hardly anyone who does not look forward to a return to the traditional way of teaching, but the experience gathered during the current difficult situation should have a positive effect on our lectures in the future.



A screenshot of the 'Future of Chemical Education' event 2021, organized as an online Zoom conference.

CHIMIA and Chemical Education



Cover pages of both CHIMIA issues dedicated to Chemical Education.

There is no doubt that any chemistry journal is a source of valuable information, which might be used in the teaching process. And there is also a decent number of journals dedicated specifically to chemical education. Yet it is great that *CHIMIA* continues to offer space for teachers and lecturers to share their knowledge, methods or experience within the Swiss community, thus enabling an efficient networking between those involved in the educational processes in chemistry. This includes, in particular, a regular *CHIMIA* Chemical Education column – a short 1–2 page contribution dealing with a chosen topic relevant to teaching chemistry.^[8] Furthermore, two entire issues were dedicated to chemical education helping to increase the awareness of the Division.^[9] The Division of Chemical Education also seeks other opportunities to further promote chemistry and chemical education *via* contributions to the journal with an outreach to the entire Swiss chemical community. We sincerely believe that the future cooperation will remain equally fruitful and we wish *CHIMIA* all the best for the forthcoming years.

- [1] <https://www.eda.admin.ch/aboutswitzerland/en/home/wirtschaft/taetigkeitsgebiete/chemie-und-pharma.html>
- [2] a) Website of the Fachgruppe Chemieunterricht of the German Chemical Society: <http://www.fachdidaktik-chemie.de/index.php>;
b) Website of the Austrian Educational Competence Centre Chemistry at the University of Vienna: <https://aeccc.univie.ac.at/>; Education website of the Royal Society of Chemistry: <https://edu.rsc.org/>.
- [3] a) Website of the Division of Chemical Education of the German Chemical Society: <https://en.gdch.de/main-navi/network-structures/divisions/chemical-education.html>;
b) Website of the Education Division of the Royal Society of Chemistry: <https://www.rsc.org/membership-and-community/connect-with-others/through-interests/divisions/education/>.
- [4] Website of the Division of Chemical Education of the Swiss Chemical Society: www.scg.ch/dce.
- [5] Activities of the Swiss-German Committee on Chemistry: <http://www.vsn.ch/DCK/DCK.html>.
- [6] Website of the International Chemistry Olympiad: <http://www.icho.sk/>.
- [7] International Chemistry Olympiad 2023 at ETH Zurich: <https://chab.ethz.ch/en/news-and-events/icho2023.html>
- [8] List of all Chemical Education columns: <https://chimia.ch/component/content/article/1773>.
- [9] a) *CHIMIA*, 2018, 72, issue 1-12;
b) *CHIMIA*, 2021, 75, issue 1/2: www.chimia.ch