



Chemical Society Annual Report to the Division of Chemical Education for 2020-2021¹

1. Abstract

The Division of Chemical Education in Finland is the national Society for chemistry teachers. The objective of the division is to inform chemistry teachers at all levels and to offer seminars and other events and to maintain cooperation between teachers and the Finnish industry. The division has about 200 members all over Finland.

2. National educational policy

Providing equal opportunities for all citizens to high-quality education and training is a long-term objective of the Finnish education policy. The key words in Finnish education policy are quality, efficiency, equality, and internationalization. The basic right to education and culture is recorded in the Constitution. The policy is built on the principles of lifelong learning and free education. Education is seen as a key to competitiveness and wellbeing of the society.

Vocational education and training (VET) will undergo a comprehensive reform in Finland. The objective is to reform vocational education and training so that it could better than nowadays respond to the changes occurring in working life and meet the future competence needs. Individual study paths will be created for both young people and adults already in working life. The significance of learning occurring at workplaces will be increased, and a new learning agreement model will be created. VET for young people and adults will be consolidated, forming a single entity with its own steering and regulation system and financing model. The current supply-oriented approach will be refocused into a demand-driven approach. Education will be competence-based and customer-oriented: Each student will be offered the possibility to design an individually appropriate path to finishing an entire qualification or a supplementary skill set. The primary importance is on what the student learns and is able to do.

Digital learning environments and new approaches to pedagogy (e.g. modern simulators) will have a larger role in the future of learning. Learning in the workplace will be increased.

In Finland, VET is organised by different types of education providers: municipalities, joint municipal authorities, the state and the private sector. An authorisation to provide education is required. In the future, education is regulated through a single authorisation license, and education providers will have increased freedom in organising their activities.

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

The reform includes examining the education provider network. VET will be available throughout the country in the future as well. The ministry will ensure that all education providers have sufficient professional and financial resources to provide education. Education providers are encouraged towards voluntary mergers.

There are up to 370 different vocational qualifications available in Finland. In the future, the number of qualifications will decrease, and the qualification content will be broadened. This supports designing individual study paths and enables more rapid responses to the changing competence needs in work life.

3. Events in chemical education

Organizations annually arranging seminars, further education, and offering services etc. for chemistry teachers are the following:

The Finnish National Board of Education (<http://www.oph.fi/english>).

The Finnish Association for Teachers of Mathematics, Physics, Chemistry and Informatics MAOL (<http://www.maol.fi>) is a pedagogical subject organization which works for the advancement of mathematics and natural sciences in Finnish society) offering local pedagogical club functions, networking, further education, and support material for education.

The aim of LUMA Centre Finland (<http://www.luma.fi/centre>) is to inspire and motivate children and youth into mathematics, natural sciences, and technology through the latest methods and hands-on activities of science and technology education. The aim is also to support the lifelong learning of teachers working on levels of education from early childhood to universities, and strengthen the development of research-based teaching.

All events were held online after the pandemic started.

4. Activities of the National Chemical Society

The Finnish Chemical Society, <http://kemianseurat.fi>, offers in-service training.

In 2020 the board for the Division of the Chemical Education in Finland gathered four times, of which two was held online due the COVID-19 pandemic.

Pre-pandemia activities:

1. On 9th of January 2020: An excursion to Viikinmäki wastewater treatment plan in Helsinki (<https://www.hsy.fi/en/water-and-sewers>). Number of participants: 10.
2. On 28th of February 2020: An excursion to Fortum – a Finnish energy company. This field trip was carried out in collaboration with the Unit of Chemistry Teacher Education from the University of Helsinki. Number of participants: 30.

During pandemia activities:

3. On 30th of March 2020: The annual meeting of the Division of the Chemical Education in Finland was held online via Zoom. The event included the annual meeting and a presentation given by Pinja Lindholm (University of Helsinki). The presentation was a bachelor thesis presentation of chemistry teachers' educational needs when adopting molecular modelling software. Number of participants: 12.
4. On the 12th of November 2020: A chemistry educational research seminar hosted together with the LUMAT Research Forum. The online event included two presentations: 1) The Relevance of Radiochemistry – Johannes Perna, University Lecturer, University of Helsinki and 2) Molecular Modelling and Feelings – Eero Jalonen, Doctoral Student, University of Helsinki.

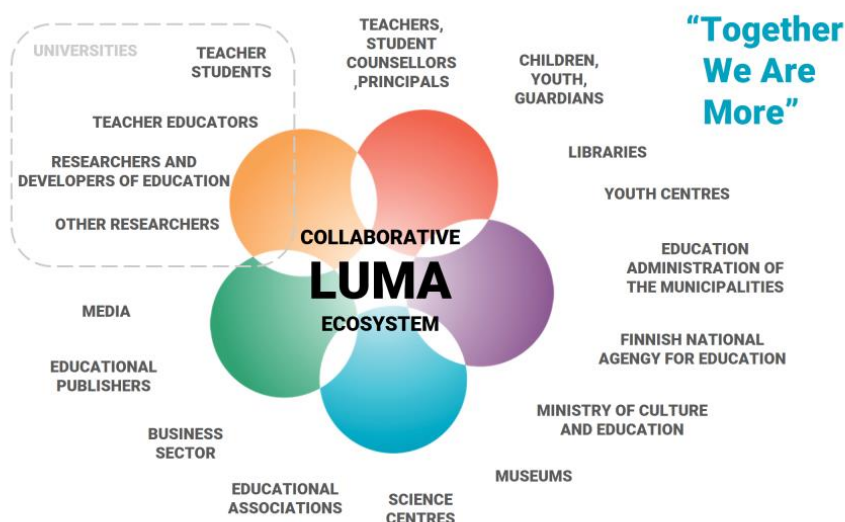
In addition, as usual, the Division awarded stipends to ten secondary school students who have showed deep interest in chemistry. The award is granted to students, who have been nominated by their teachers.

5. Publications

LUMAT journals are published by the University of Helsinki, Finland and LUMA Centre Finland. LUMAT publishes peer-reviewed research articles on math, science and technology education. Articles include research papers and perspective papers. LUMAT was established in 2013. <https://www.lumat.fi/>

6. Liaison with the chemical industry

LUMA centre Finland serves a strong link to between educational units and the chemical industry.



Further information on the activities of the chemical industry is found at the home page of The Chemical Industry Federation of Finland. The Chemical Industry Federation of Finland has nearly 400 member companies and 13 member, cooperation and agreement associations.

The Chemical Industry Federation of Finland is a member of Cefic, which is the European Chemical Industry Council. Global cooperation takes place via the International Council of Chemical Associations, ICCA. It is a trade association for the chemical industry and its closely related sectors, covering various fields in the basic and production chemical industry. The chemical industry in Finland has set an ambitious goal: Finland strives for carbon neutrality by 2045. More information can be found at <https://www.kemianteollisuus.fi/en/>

7. International and European initiatives

Members of the Finnish Chemical Societies and its divisions have participated in numerous international networks, expert committees, and projects for example in the IUPAC Committee on Chemistry Education, Division of Chemical Education of the European Association for Chemical and Molecular Sciences, and in European Chemistry and Chemical Engineering and Education Network activities.

8. Other events and activities

Other activities of the Finnish Chemical Society is found at the home page of the society: <https://kemianseurat.fi/kemia>.

During the pandemic teaching methodologies have been further developed:

- Contact teaching via Zoom using online teaching or recorded teaching events
- Feedback: the students have clearly suffered from the lack of conventional student to teacher contact, however, the students have taken a large number of courses (the Faculty of Science has reported good number of credits)
- Experimental work via home chemicals in Zoom
- Only small lab group teaching at the University of Helsinki, Department of Chemistry has been allowed
- All teaching collaboration with partner institutions has been cancelled and instead done over Zoom
- Virtual visits to ChemistryLab Gadolin (5% capacity in use)

9. Name of delegate

Dr. Susanne Wiedmer, PhD, docent

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Finland's representative in the IUPAC Committee on Chemistry Education (CCE) and Analytical Chemistry (Division V), as well as in the EUChemS Division of Chemical Education (DivCEd)

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