Chemical Society Annual Report to the EuChemS Division of Chemical Education for 2021-2022

1. Abstract
   Even though we still have very little man- and women-power in chemistry education in Austria, we are quite successful in initiating and organising events and continuing development programmes for Chemistry Teachers. We are active in publishing papers in German and English for teachers and scholars as well as participating in national and international conferences.

   Due to the pandemic situation, some scheduled workshops could not take place in schools. The PlusLucis teacher education week in February 2022 was changed to an online mode at short notice. Additionally, we organised online teacher education workshops to give chemistry teachers the opportunity to share experiences and expertise with online teaching tools.

2. National educational policy
   The development of new national curricula for all subjects in primary and lower secondary schools is now completed and will be implemented starting in September 2023. Anja Lembens was commissioned by the Austrian Federal Ministry of Education, Science and Research to build and lead the group for the chemistry syllabus. Aim of the new curriculum is to focus more on competencies to deal with and value knowledge then on learning and reproducing content knowledge. We decided to use the didactic model of ‘basic concepts’ for structuring content knowledge, competencies and skills. All textbooks will be revised and adapted to the new objectives.

3. Events in chemical education
   Many planned events were cancelled due to the Coronavirus-Pandemia, but some could be held in person and/or online mode. For example:

   - University course "FLEX-based learning"
     For teachers who teach biology, chemistry, computer science, mathematics, or physics in lower and upper secondary schools and who want to teach creative problem solving to their students using new teaching techniques.
       - Didactic concepts for the diagnosis and promotion of creative problem-solving skills
       - Concrete teaching techniques and experiments for science teaching
       - Techniques for strengthening team processes and self-efficacy

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1 June 2021 - May 2022, all levels of chemistry education: primary, secondary schools, universities, LLL, general and vocational education.
University course "Innovative problem solving – School as a think tank of creative solutions"
For Teachers, of STEM subjects at secondary level I and II, who are interested in creative
techniques in order to develop innovative ideas professionally. For Teachers who face STEM
challenges in school and who are committed to the Sustainable Development Goals.
  o Creativity techniques such as morphological box, stimulus word association,
bisociation, etc.
  o Creative project management such as design thinking, dragon dreaming, etc.

Kinderuni (University for Children – Science and chemistry workshops for children (age 7-12))
Farbe, Frühjahr, Fluoreszenz – Chemie und Physik rund um farbige Ostereier und den
Frühling (Colour, Spring, Fluorescence – Chemistry and physics around coloured Easter
eggs and springtime – Workshop open to the public)
SpottingScience – Eine Portion Naturwissenschaften für das Wochenende. Pop-Up-Store
(SpottingScience – A dose of natural science for the weekend. Pop-up store – Workshop
open to the public)
Carbonfootbricks – Mit Bausteinen den ökologischen Fußabdruck bauen und nachhaltige
Entscheidungen treffen – Tag der Naturwissenschaften (Carbonfootbricks – Building the
ecological footprint with building blocks and making sustainable choices – Science Day
Chemietage (Chemistry days – a conference for teachers and teacher educators from
Austria, Italy, Switzerland, Germany and the Netherlands)

4. Activities of the National Chemical Society

5. Publications
Since several years, we publish a journal for chemistry and physics teachers with four issues per
year (PlusLucis). The working group of the Austrian Educational Competence Centre Chemistry
at the University of Vienna contributes to every issue (four per year) of the chemistry teacher
journal Chemie & Schule.

In the following publications from the University of Vienna, the Tyrolean College of Teacher
Education in Innsbruck, the Upper-Austrian College of Teacher Education in Linz, the University
of Salzburg and the College of Teacher Education Salzburg as well as the University of Graz are
listed alphabetically.

   Validation Study Measuring Divergent Problem Solving Ability. Creativity Research

   Schülervorstellungen. [Development of video vignettes to address students’ beliefs]
   In: Habig, S. & van Vorst, H. (Eds.). Unsicherheit als Element von naturwissenschafts-
   bezogenen Bildungsprozessen. Gesellschaft für die Didaktik der Chemie und Physik.
   Jahrestagung 2021. https://gdcp-ev.de/tagungsbande/tagungsband-2022-band-
   42/.

   erklärt, einfach umgesetzt - das kann jeder! [33 Ideas Digital Media Chemistry - Step-
   by-step explained, easily implemented - anyone can do it!]. Augsburg: Auer Verlag.


There is no cooperation between the didactics in pre-service chemistry teacher education and industry.
7. **International and European initiatives**
   The Tyrolian College of Teacher Education is coordinator of the Erasmus+ project **VidNuT**
   The University of Innsbruck is the coordinator of the Erasmus+ project **sensiMINT**
   The Austrian Educational Competence Center Chemistry (AECC Chemistry) is partner in two transnational Erasmus+ programmes:
   - **sensiMINT** deals with language sensible teaching material for chemistry and biology. https://www.sensimint.eu/
   - **VidNuT** develops video-vignettes to foster professional vision in chemistry, physics and technology teacher education. https://www.vidnut.eu/

   The Upper-Austrian College of Teacher Education contributes to the following Erasmus+ programmes:
   - **SchoolEducationGateways**
     https://www.schooleducationgateway.eu/de/pub/teacher_academy/catalogue/results.cfc
   - University of Salzburg contributes to the following project:

8. **Other events and activities**
   In June 2020 the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology established a platform for “Green Chemistry” where Anja Lembens is elected as representative for primary and secondary Chemistry Education.

   Science-Spotlights at the campus of the University of Vienna (Focus: Green Chemistry)
   Science-Spotlights at the Dachstein-Glacier (in cooperation with the Dachstein cable car).
   www.spottingscience.com

   Foundation of the "SCHOOL OF CREATIVE SOLUTIONS".
   This is an initiative to raise the importance of science subjects by targeting these subjects to develop the creative problem-solving potential of young people. Schools receive this school label if they have teachers in their ranks who have completed the above-mentioned courses “flex-based Learning” and ”Innovative Problem Solving” and actively implement their contents in the school. In June 2021, the first 10 schools across Austria were awarded the label of "School of Creative Solutions".

   The College of Teacher Education in Salzburg and the University of Salzburg contribute to the following project:
   - **Augmented learning lab Salzburg** https://edtechall.at/en/home

9. **Name of delegate and deputy**
   Univ.-Prof. Dr. Anja Lembens

10. **Contact details of delegates**
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11. CV of delegate

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