



Chemical Society Annual Report to the EuCheMS Division of Chemical Education for 2019-2021¹

1. Abstract

Much of face to face education was disrupted in March 2020 due to Covid-19, with primary and second-level schools online from March to May 2020, and again from January to mid-April 2021 (with staggered returns from early March to mid-April). Third-level was also disrupted with all teaching (lectures and tutorials/seminars) delivered virtually from March 2020 to date. Limited laboratory work was possible for undergraduate chemistry students, with much of this carried out virtually.

The 2nd level final year state examinations were modified due to Covid restrictions over the last two years. However, all students received results marking their completion of their second level schooling. Some additional places were available in 3rd level institutions.

Despite the challenges presented by the Covid-19 pandemic the Irish chemistry education community were extremely active throughout the reporting phase.

2. National educational policy

New Curricula:

The Leaving Certificate specifications in Chemistry (and also Physics and Biology) are currently being reviewed and revised. The current syllabi were introduced in 2000 and while a new specification was developed in March 2014, it was not implemented due to the uncertainty re the practical coursework component. The current revisions are taking into account the changes that have taken place in the science curriculum for the first 3 years of second level and also examining the feasibility of integrating a coursework assessment component, broadening the examination from written examination only and also allowing assessment of other skills.

At 2nd level:

Much of the teaching has been online since March 2020 – at primary, & second level. The National written examinations (Leaving Certificate) at the end of second level were replaced in 2020 with Accredited grades, which comprised of standardisation by the State Examinations Commission of teacher/school estimated grades for each student. In 2021, students had the

¹June 2019- May 2021

option to take the national written examinations and /or the Accredited grade and were awarded the higher of the two grades between examination and accredited grade.

Due to somewhat higher grades being awarded and also an increase in places available in 3rd level courses, more students were eligible for places at Universities and colleges and this has led to greater numbers taking 3rd level courses.

At 3rd level:

Third-level has seen some significant changes in both laboratory work and student in-take numbers. Much of the teaching has been on-line at 3rd level – so it will be interesting to see the effect of this on laboratory work next year and throughout the course of the students' studies. Additionally, there are higher numbers of students in all courses, which raises questions regarding how institutions will cope with these numbers as we move back towards in-person learning in the coming months and years.

The continued merger of the Institutes of Technology has given rise to 2 additional designated Technological Universities, Munster Technological University (MTU), and Technological University of the Shannon (TUS). Two further designations are expected in the future – as Technological University for the South-East Ireland (TUSEI), and Technological University for the West and North-West of Ireland.

3. Events in chemical education

Annual staples in the chemical education (and STEM education) calendar continued in a virtual format, some examples are highlighted below:

BT Young Scientist and Technology Exhibition: The BTYSTE is a national Science Fair run by BT Ireland, and is one of the largest Science Fairs globally. It took place virtually in January 2021, with over 550 projects from 213 schools qualifying to take part from an initial entry of over 1,350 projects. With over 105,000 attendees from 77 countries, the virtual event proved to be a great success for all involved. <https://btyoungscientist.com/>

SciFest: SciFest provides a forum for students at local/regional/national level to present and display their scientific investigations. The SciFest programme consists of a series of one-day STEM fairs for second-level student and is designed to be as inclusive and accessible as possible. Due to restrictions, the 2020 and 2021 Scifest were online, with students submitting their projects for judging. <https://scifest.ie/>

Irish Science Teachers Association (ISTA) Conference – The ISTA Conference 2021 was held virtually in March 2021. The theme of this year's conference was "The Big Ideas in Science Education and Hope for the Future". It was inspired by the current work on the Senior Cycle Science syllabi and rapidly changing World that we live in. A chemistry education highlight was Prof. Sir Martyn Poliakoff on Mendeleev. <https://www.ista.ie/conference-brochure-2021/>

Science week 2020: Science Week ran from 8-15th November in 2020 with virtual events hosted by Festivals across the country. <https://www.sfi.ie/events/festivals/>

Chem-Ed Ireland: ChemEd Ireland is a one-day annual conference on Chemistry Education mainly for Chemistry teachers. This annual event provides an opportunity to network and to

share resources and ideas relevant to teaching chemistry in Ireland. In October 2019, it was hosted by Technological University Dublin and the theme for the conference was the International Year of the Periodic Table. In October 2020, the conference was held virtually and hosted by UCC. The virtual nature of the event gave rise to a very high attendance (over 220). While the social dimension of the conference was lacking, the event reached a wider audience due to its virtual nature and hence is a point to note for future events.

International Chemistry Olympiad: Ireland selects and sends a team to participate in the IChO each year. The Irish Chemistry Olympiad Organising Committee comprised of a group of academic staff across five higher education institutes in Ireland – DCU, TCD, AIT, GMIT and UCC. For IChO 2020, Round 1 selection was held in person pre lockdown; however, final selection, training and the event itself was conducted remotely. Given the range of uncertainties during this time, the Irish team performed very well under the circumstances. https://icho2020.tubitak.gov.tr/storage/Guidelines%20&%20Decisions/IChO_2020_Final_Report_Turkey.pdf

For IChO 2021, all of the selection examinations, and training was carried out on line and the teams completed the IChO tests in a central location in their own country. (Update July 2021 – the Irish team competed successfully at IChO 2021, and secured 2 silver medals, a bronze medal and an Honourable Mention; an outstanding achievement) <https://www.icho2021.org/>

4. Activities of the National Chemical Society

ICI Young Chemists Network (ICI-YCN): The newly formed ICI-YCN is the young division of the Institute of Chemistry of Ireland and represents the interests of all young chemists in Ireland. Its aim is to promote networking and collaboration opportunities for early stage researchers by organising conferences and networking events for young chemists. It also aims to support young chemists by providing a platform to promote upcoming positions suited for young chemists. <https://www.chemistryireland.org/young-chemists-network/>

Awards: (Further details are available here: <https://www.chemistryireland.org/awards-events/>)

The Boyle Higgins Gold medal and Lecture Award was presented to Professor Suresh Pillai (IT Sligo) in 2019 and to Professor Amira P. de Silva (QUB) in 2020, in recognition of their outstanding and internationally recognised research contribution to the advancement of chemistry.

The ICI Annual Award for Chemistry - Eva Philbin Public Lecture Series was presented to Professor Declan McCormack (TUD) in 2019 and Professor Declan Gilheany (UCD) in 2020 for their significant contribution to the advancement of chemistry and raising the profile of chemistry through effective communication to a wider audience.

The ICI David Brown Award 2021 was presented to Professor Nicholas Farrell (Virginia Commonwealth University, USA)

ICI Postgraduate Award is for PhD students who have demonstrated excellence in research through publications and have shown a commitment to supporting and promoting Chemistry. The awardees were Priyanka Ganguly (Sligo IT) and Conor Crawford (UCD) in 2020 and Saoirse Dervin (Sligo IT) in 2019.

Second Level Education Award was presented to Brian Durkan, St. Muredach's College, Ballina, Co. Mayo and Óran O'Sullivan, Coláiste Choilm, Ballincollig, Co. Cork for their achievement in obtaining the highest chemistry grades in Ireland at Leaving Certificate in 2019.

Research Colloquium – Irish Chemistry Research Colloquium was held on from the 17th -18th of June 2021 (virtually) at the University of Limerick (UL). The event was hosted by the Department of Chemical Sciences and the Bernal Institute at UL.

5. Publications

The publications of the ICI are available at <https://www.chemistryireland.org/news-publications/#chemire>, in particular

Irish Chemical News

Chemistry in Action! <https://www.cheminaction.com/>

6. Liaison with the chemical industry

Many third-level institutions have strong links with industry reflected in both research and teaching. One such example is presented here for illustrative purposes:

SSPC PhD programme: SSPC is the Science Foundation Ireland (SFI) Research Centre for Pharmaceuticals and one of the largest national producers of chemistry PhD graduates. The aim of SSPC is to deliver industry-relevant technical solutions, which result in job growth and retention within this sector in Ireland and grow the skills base of qualified scientists and engineers. A key impact of SSPC is the creation of a unique talent pipeline with the transition rate of SSPC researchers to industry currently standing at 70%. One of the key drivers facilitating this is the SSPC PhD industry placement programme, which brings students into the industrial environment for a three-month placement aligned with their research area. During their placements, students have industry mentors, to provide guidance and to help them to expand their professional networks. Companies benefit from invaluable research expertise. The student placements in academic and industry partners are important components of the Structured PhD programme, and are carefully managed to ensure that students gain enhanced knowledge and experience, honing their ability to work in interdisciplinary teams and to undertake cross-disciplinary activities.

STEM Teacher Internship Programme: provides pre-service STEM (Science, Technology, Engineering and Maths) teachers with the opportunity to gain skills and experiences within the STEM Industry. The programme was developed together with Accenture and the 30%

Club with the overall aim of providing future STEM teachers with a personal experience of STEM roles and careers in the industry. This, in turn, will empower them to inspire future generations of their own students, particularly female students, to engage in STEM subjects and careers.

7. International and European initiatives

EuChemS Chemistry Congress 2024 will be hosted by Institute of Chemistry of Ireland in Dublin

Institutions in Ireland are partners in several EU funded projects involving Chemistry education. For example:

‘Diversity in Science for Social Inclusion’ (DiSSI) project: (2019-2023, Erasmus+, Irish partner Dr Sarah Hayes (SSPC, UL))

aims to address a gap in research and practice. Diversity is multidimensional in nature and the consideration of only one dimension of diversity can yield inclusive practices of only limited scope. <https://dissi.org/>

‘Educating science teachers for all’ (ESTA) project (2020-2023, Erasmus+, Irish Partner Dr Catherine Martin (UL, MLAL); Dr Sarah Hayes (SSPC, UL)

aims to develop more responsive and inclusive science education by developing training programmes for pre- and in-service science teachers to include the issues of cultural diversity and linguistic heterogeneity. <https://esta-project.eu/>

8. Other events and activities

President of Ireland Michael D. Higgins is the patron of the Institute of Chemistry Ireland.

9. Contact details of delegates.

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