"It was an excellent conference all around. It was really stimulating and engaging and so beneficial to be able to engage face-to-face with people after Covid isolation and virtual conferences. Very well organised. I don't know why, but somehow the conference seemed to be particularly effective at encouraging discussion with a wide range of people—old and new acquaintances. I had so many highly stimulating discussions with so many different people throughout the conference. It was outstanding! Thank you! "

"Thank you so much for all the hard work you've put in over the years and your tenacity in making this a reality! Also great that you've put in so much effort to try to make a difference to the local community as well! "

"Overall good job given the uncertainty of the COVID pandemic, heartfelt congratulations for pulling off the conference after a delay of two years. I am very glad that many African chemistry educators are given a chance to showcase their research which might not be possible if the conference is held outside Africa. "

In summary, the conference achieved the objective of bringing the ICCE family together again at an in-person event. The conference enabled delegates from Africa to attend an international conference as well as leaving a legacy to promote the field of chemical education among secondary and tertiary educators. The local community was also enriched as items such as conference bags were made by women working in a non-government organisation which promotes job creation.

Acknowledgements

In my capacity as Chair of the Local Organising Committee I should like to thank the following people who contributed to the success of ICCE 2022:

- The President of IUPAC, Javier García Martínez for attending the conference and presenting inspiring messages to the delegates at the conference, the teachers who attended the Teacher Day, and the audience at the YAC activities at the Cape Town Science Centre. His ability to pitch the message at the level of the audience is to be admired.
- The Local Organising Committee for their hard work and persistence during the longest tenure of any organising committee in the history of ICCE conferences, in particular René Toerien, who organized both the Teacher Day and the Stationery Drive.
- The National and International Advisory boards for input on various aspects of organising the conference, in particular thanks are due to Marissa Rollnick for compiling the conference programme and Helen Drummond for taking notes during the conference.
- The reviewers for their time and effort necessary to review the abstracts.
- The delegates, whose presence was so gratifying after the uncertainty posed by the COVID-19 pandemic. Thank you for their excellent presentations, posters, and workshops.
- Jan Apotheker and Marietjie Potgieter, the past and present chairs of the IUPAC Committee for Chemistry Education, for their guidance and support through many discussions about logistics and planning.
- The sponsors for financial support.
- Debbie Rorich and her staff from Event Management solutions whose can-do attitude in the face of many obstacles was instrumental in bringing plans to fruition in terms of running the conference.

I should like to end with a quote from Jonathan Jansen who gave a brief address at the opening ceremony. His message sums up the challenge for chemistry educators in a changing world: He urged the delegates to:

"teach chemistry for attitude, teach chemistry for meaning, and teach chemistry for change."

Bette Davidowitz, a professor at the University of Cape Town, is chair of the L ocal Organising Committee (LOC).

ICCE—a short historical perspective

by Elise de Vries

The pandemic of 2020 prompted me to conduct research into the teaching and learning of chemistry, and so as a new member of the Chemistry Education community, I eagerly anticipated the commencement of the 2022 International Conference on Chemistry Education (ICCE). conference. As a first timer, I was interested in the conference's history, and my objectives were to understand global educational concerns, past and present, and look for solutions to my classroom dilemmas.

At right, the welcome address of Javier García Martínez at the opening ceremony.

Below right, Bette Davidowitz, 26th conference chair.

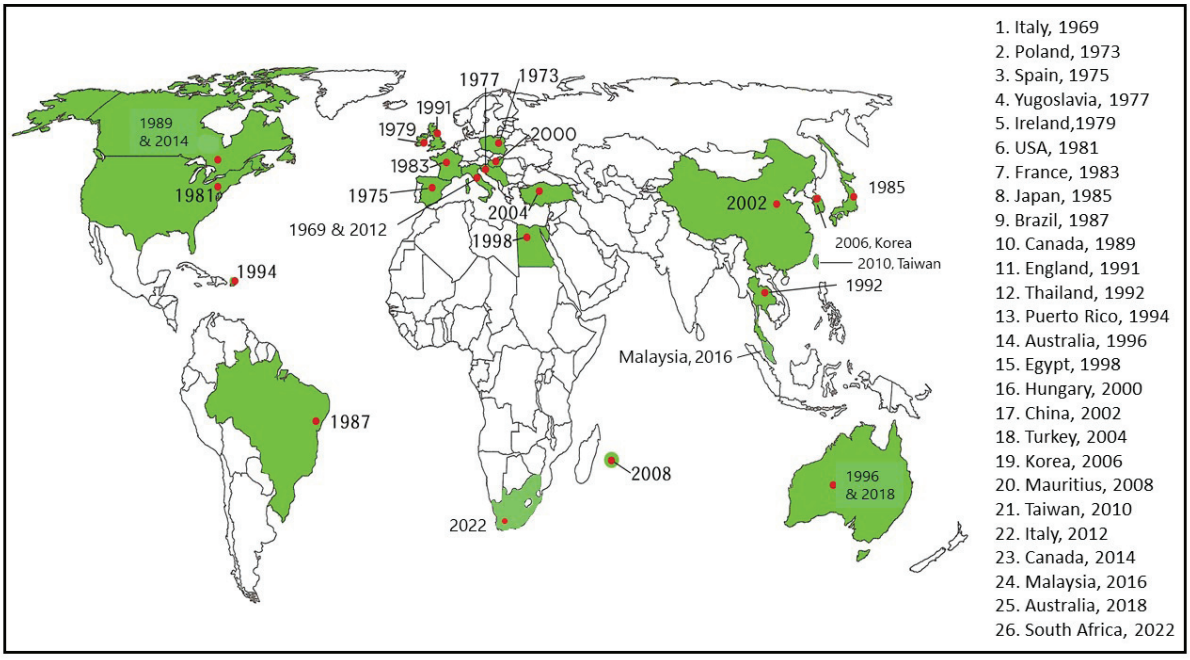
The first ICCE conference was hosted in Frascati, Italy, in October 1969. The conference has always been held biannually, save for two occasions. The first occasion occurred in the early 1990s when the event was changed to fall in an even year and was thus held two years in a row. The second occasion occurred more recently when the 26th conference was postponed in 2020 due to the COVID pandemic, resulting in a four-year hiatus. Given this, Bette Davidowitz, the chair of the 26th conference, received recognition for her dedication to planning the event for five years and for holding the position of conference chair for the most extended period.

The ICCE conference has been held in several countries, some of which have hosted the event more than once. The 26th conference was the fourth to be held in the Global South and the second to be held in Africa. As a result of its location, it attracted a sizable number of African delegates, with an equal number of international and African attendees. However, due to travel restrictions and numerous global events, fewer delegates attended this conference than previously hosted ICCE events. Thus, with 150 participants, the conference had an intimate atmosphere, making networking and establishing contacts easier.

The 26th conference, "Responding to 21st centenary imperatives," was strongly linked with the 2030 Sustainability Development Goals, which were presented by the IUPAC president, Javier García Martínez, in the opening ceremony. The theme of sustainability was revisited throughout the conference as it was restated in the plenary presentations of Thomas Holmes (Iowa State University), "Systems thinking in foundational chemistry: connecting chemistry content to earth and societal systems;" Ruby Hanson (University of Education, Winneba), "Role of chemistry education in managing humanitarian challenges;" and Ozcan Gulacar (University of California, Davis), "Empowering and inspiring

the future generation: Uncovering relevancy and meaning in chemistry education." These presentations demonstrated how closely chemistry is tied to the Earth's systems and humanity, highlighting the significance of educating society about these connections to build a sustainable future. Similar themes have been discussed at earlier conferences, as seen from the conference themes. Therefore, there is a repeating message that chemistry educators must recognise their obligations to the environment and future generations.

The 26th ICCE programme had seven core themes, and the majority of the oral presentations were in the category of Teaching and learning, pedagogy, and cognition. Looking over the programmes of the two previous conferences revealed that this core pedagogical theme was also included, although the 26th conference had a more significant number of presentations on the topic. According to the percentage contribution, the Australian conference

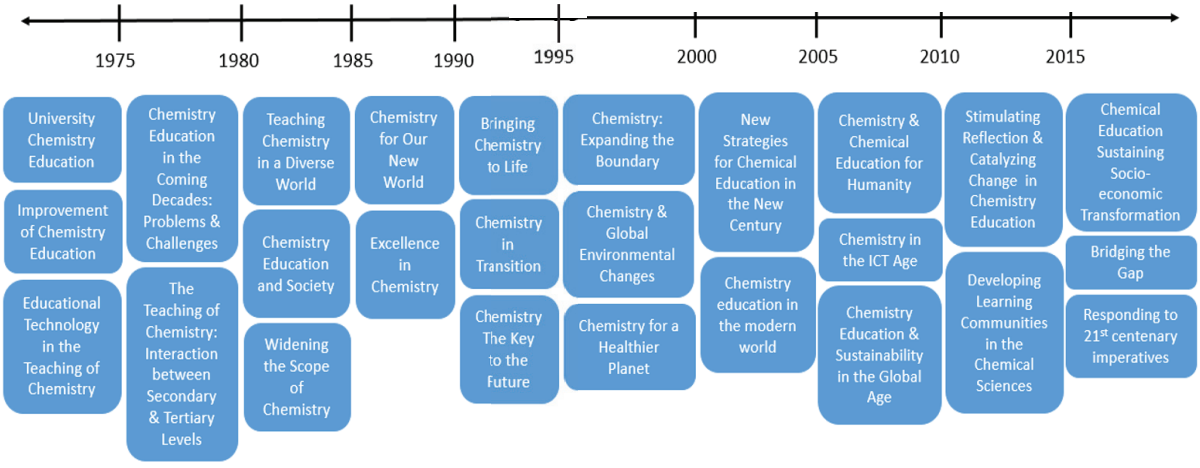


ICCE hosting countries and dates (Source: Chemistry International, Vol. 26, No. 6, p. 15, 2004)

placed a stronger emphasis on learning in the lab, whereas the Malaysian conference focused on teaching and learning chemistry at the secondary level. Public awareness and sustainability were topics covered by all three conferences, highlighting, once again, their significance and the necessity for our attention.

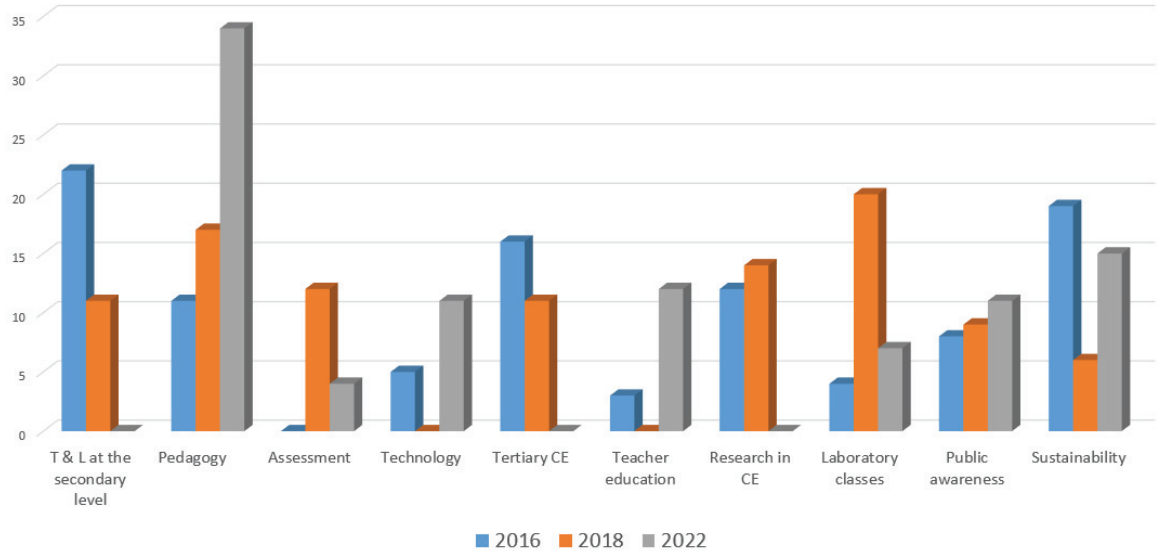
The main message of the 26th conference was that we, as chemistry educators, must reconsider how we teach the next generation and do more to prepare them for the challenges ahead. In her closing speech, Marietjie Potgieter stated, "There is an urgency for action, as we need to rethink our practices as the imperatives are pressing." One approach, described in numerous presentations and two workshops, was the use of systems thinking and planetary boundaries as tools to help students grasp multiple interactions between chemistry and human activities and the environment. This approach shifts the chemistry curriculum from the abstract to a focal point in the real world, making the subject more accessible and relevant.

Overall, the conference left me with the impression that many aspects of Chemistry Education research still need to be explored. This is understandable as chemistry education will adjust, expand, and change



Previous ICCE conference themes

2016 - Malaysia		2018 - Australia		2022 – South Africa	
Teaching & learning chemistry at the secondary level	22	Linking to secondary education research	11		
Pedagogy and other T & L methodologies	11	Re-imagining the chemistry classroom paradigm	17	Teaching & learning, pedagogy & cognition	34
New technologies in chemical education	5	Translating assessment into the next dimension	12	Curriculum and assessment reform initiatives	4
Tertiary chemistry education & lifelong learning	16	Enhancing the transition to tertiary chemistry	11	Effective instruction in the online environment	11
Chemistry / science teacher education	3			Teacher education, knowledge & development	12
Research in chemical education	12	Creating the nexus between research & practice	14		
Laboratory classes in chemical education	4	Joining the dots in laboratory learning	20	Rethinking laboratory training post-COVID-19	7
Public awareness and appreciation of chemistry	8		9	Context and diversity in chemistry education	11
Green & environmental chemistry education	11	Systems thinking in chemistry education	6	Chemistry for sustainability	15
Chemical weapons and chemical safety	8				



ICCE oral presentation frequency of core themes at the conferences in 2016, 2018, and 2022 (Source: conference programmes)

as it responds to the urgent needs of the global community. I'd like to end with a quote from the conference that perfectly encapsulated what the community is attempting to accomplish.

As stated in his opening address, Johnathan Jansen advised delegates to engage in "Teaching for attitude, teaching for meaning and teaching for change."

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