

# Chemistry Education Research and Practice

rsc.li/cerp

A fully refereed electronic journal for teachers, researchers and other practitioners in chemistry education

## IN THIS ISSUE

ISSN 1756-1108 CODEN CERPCE 26(4) 797–1048 (2025)



### Cover

See Kristy L. Turner *et al.*, pp. 804–820. Image reproduced by permission of Maha Khan from *Chem. Educ. Res. Pract.*, 2025, **26**, 804. Artwork created by Maha Khan.



### Inside cover

See Thomas Swift and Clare-Louise Peyton, pp. 821–833. Image reproduced by permission of Thomas Swift and Clare-Louise Peyton from *Chem. Educ. Res. Pract.*, 2025, **26**, 821. Photographs reproduced with consent. All rights reserved.

## PAPERS

804

### Arrows first? – a qualitative exploration of how mechanistic organic chemistry is taught in the A-level curriculum in England

Kristy L. Turner,\* Nathan Owston, Carl Poree, Colin Evans, Ali Mohammed and Maha Khan

821

### Analysis of a degree level learners through a pandemic: the importance of vocation-linked education for chemical scientists in full time education and on apprenticeship studies

Clare-Louise Peyton\* and Thomas Swift\*



# Advance your career in science

with professional recognition that showcases your **experience, expertise and dedication**

## Stand out from the crowd

Prove your commitment to attaining excellence in your field

## Gain the recognition you deserve

Achieve a professional qualification that inspires confidence and trust

## Unlock your career potential

Apply for our professional registers (RSci, RSciTech) or chartered status (CChem, CSci, CEnv)

## Apply now

[rsc.li/professional-development](https://rsc.li/professional-development)



## PAPERS

834

**Developing self-reflection in students: a case study in chemistry education**

Maila Pentucci, Andrea Mascitti, Nicola d'Alessandro, Lucia Tonucci\* and Francesca Coccia

846

**Why chemistry instructors are shifting to specifications grading: perceived benefits and challenges**

Ying Wang, Haleigh Machost, Brandon J. Yik and Marilyne Stains\*

867

**Dialogical modelling processes: conversations for the social construction of scientific models in the science classroom**

A. Cortés-Morales,\* A. Marzabal and D. Couso

884

**Understanding the reasons and cues that guide general chemistry students' studying decisions**

Kendra Keenan, Andrew Baquero, Ebtisam Alsharabi and Justin M. Pratt\*

909

**Pre-collegiate factors contributing to the choice of a chemistry major: the role of science capital**

Roslyn Arlin Mickelson,\* DeeDee Allen, Martha Bottia, Elizabeth Stearns, Melissa Dancy and Stephanie Moller



## PAPERS

926

**Identifying skill inequalities in undergraduate chemistry laboratory teaching**

Aaron G. Jimenez and David P. August\*

936

**Structuring productive group work with Marzano's taxonomy: a study of cognitive scaffolding and group learning**

Andrew Kreps, Kodi Dailey and Renee Cole\*

956

**Duality between the discourse and practice of a secondary school chemistry teacher: a case study involving a structured inquiry**

Karine Molvinger

977

**Exploring the artificial intelligence interaction profiles of participants with different levels of teaching experience for lesson planning in the context of acids and bases**

Sevgi Aydin Gunbatar,\* Gizem Tezcan Sirin, Onur Can Ilkyaz and Yusuf Mutlu

996

**The relationship between chemistry growth mindset and chemistry academic engagement: a multiple mediation model**

Haoran Sun, Wujun Sun, XinYue Liu, Mutong Niu and Yurong Liu\*



## PAPERS

1012

**What's on my surfaces? design and implementation of an indoor surface films CURE-inspired project**Andrea L. Van Wyk,<sup>\*</sup> Alexandria Julius, Lauren Andrews, Binaya Shrestha, Scott K. Shaw and Renée S. Cole

1031

**Reasoning through uncertainty: expert chemists' analogical thinking on a novel problem**Kyle Bergeron, Diren Pamuk Turner<sup>\*</sup> and David Hammer