

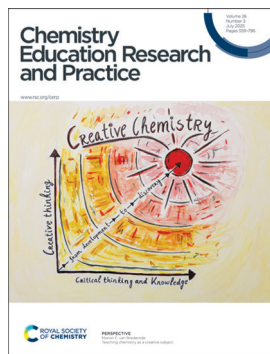
# Chemistry Education Research and Practice

rsc.li/cerp

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

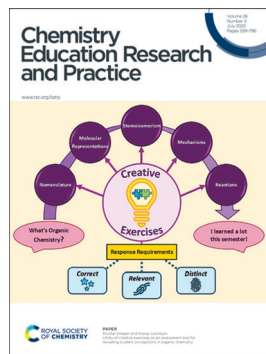
## IN THIS ISSUE

ISSN 1756-1108 CODEN CERPCE 26(3) 559–796 (2025)



### Cover

See Marion E. van Brederode, pp. 594–602. Image reproduced by permission of Marion van Brederode from *Chem. Educ. Res. Pract.*, 2025, **26**, 594. Artwork created by Esther R. van Grondelle.



### Inside cover

See Krystal Grieger and Alexey Leontyev, pp. 603–618. Image reproduced by permission of Alexey Leontyev and Krystal Grieger from *Chem. Educ. Res. Pract.*, 2025, **26**, 603.

## REVIEWS

566

### Innovative approaches in chemistry teaching: a systematic review on the use of improvised chemicals for student engagement and performance

Celestin Ngendabanga,\* Jean Baptiste Nkurunziza and Leon Rugema Mugabo

578

### A review of research on the teaching and learning of quantum mechanics

Slade C. McAfee, Field M. Watts and Jon-Marc G. Rodriguez\*



# RSC Advances

At the heart of open access for  
the global chemistry community

Editor-in-chief

Russell J Cox

Leibniz Universität Hannover, Germany

We stand for:



**Breadth** We publish work in all areas of chemistry and reach a global readership



**Affordability** Low APCs, discounts and waivers make publishing open access achievable and sustainable



**Quality** Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal



**Community** Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

[rsc.li/rsc-advances](https://rsc.li/rsc-advances)

@RSC\_Adv



## PERSPECTIVE

594

**Teaching chemistry as a creative subject**

Marion E. van Brederode

## PAPERS

603

**Utility of creative exercises as an assessment tool for revealing student conceptions in organic chemistry**

Krystal Grieger and Alexey Leontyev\*

619

**Perception and experience of heterosexism by non-heterosexual students in a chemistry classroom: an interpretivist study**

Wing-Fu Lai\* and Sreekanth Reddy Obireddy

631

**How primary school students use their disciplinary drawings to navigate between everyday and scientific discourses of water**

Bodil Sundberg,\* Johanna Andersson, Sofie Areljung, Carina Hermansson and Marianne Skoog

647

**Organic chemistry students' usage of electrostatic potential maps across an unstructured and structured card sort**

Chloe K. Robinson, Melissa Weinrich and Scott E. Lewis\*



## PAPERS

660

**What beliefs do chemistry teachers have about instructional explanations? An exploratory investigation**

Beate Fichtner and Katharina Groß\*

682

**Influence of self-efficacy and metacognition on malaysian pre-university students' chemistry academic motivation: the moderating role of gender and locality**

Byron MC Michael Kadum and Mageswary Karpudewan\*

701

**Aligning graduate chemistry training with diverse career paths: insights from student perceptions of valued skills**

Jherian K. Mitchell-Jones, Brandon J. Yik, Haleigh Machost and Marilyne Stains\*

718

**Linking departmental climate to the sense of belonging of chemistry graduate students and postdocs: evaluation and insights from the DCaDEI survey**

Lu Shi, Christiane N. Stachl and Maia Popova\*

734

**Examining the influences of peer and teacher support on chemistry learning satisfaction: an analysis of a serial mediation model**

Qian Huangfu,\* Hanxi Wang and Liping Zhu



## PAPERS

748

**Sense of belonging in a large enrollment general chemistry course: change over a semester, gender and ethnic group differences**

Abayneh Lemma, Keila Muller, Zamira Torres, Camila Senespleda and Tamra Legron-Rodriguez\*

761

**Development of enacted pedagogical content knowledge (ePCK) among pre-service chemistry teachers: the role of peer coaching enriched with content representation (CoRe) and teaching practice**

Cansu Yildiz, Hulya Gizem Urlu, Kardelen Azra Ates and Yezdan Boz\*

780

**Examining student engagement in the organic chemistry laboratory**

Devin Pontigon\* and Vicente Talanquer

