

# Designing Professional Learning for “Out of Field” Teachers of Years 7-10 Chemistry

Lisa Chiavaroli<sup>1,6</sup>, Seamus Delaney<sup>2,6</sup>, Carolyn Drenen<sup>3,6</sup>, Mick Moylan<sup>4,6</sup>, Gaya Vazirani<sup>5,6</sup>.

[lisa.chiavaroli@monash.edu](mailto:lisa.chiavaroli@monash.edu), [s.delaney@deakin.edu.au](mailto:s.delaney@deakin.edu.au)

<sup>1</sup> School of Curriculum, Teaching and Inclusive Education, Monash University, <sup>2</sup> School of Education, Deakin University, <sup>3</sup> Pascoe Vale Girls College, <sup>4</sup> School of Chemistry, University of Melbourne, <sup>5</sup> Alkira Secondary College, <sup>6</sup> Chemistry Education Association







# Acknowledgement of Traditional Owners

I am presenting today from the lands of the Wurundjeri Woi-wurrung people and I wish to acknowledge them as Traditional Owners.

I would also like to pay my respects to their Elders, past and present, and Aboriginal Elders of other communities who may be here today.





# What is the Chemistry Education Association (CEA)



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<https://www.cea.asn.au/>

## ABOUT US >

The CEA was established in 1977 by a group of Secondary and Tertiary chemistry educators. We are a not-for-profit association that promotes the teaching and learning of chemistry in schools.

## CONTACT >

T: (03) 8344 6465

E: [mmoylan@unimelb.edu.au](mailto:mmoylan@unimelb.edu.au)

PO Box 4142

University of Melbourne

Parkville 3052



## WHAT WE DO

We're an association that promotes the teaching and learning of chemistry in schools.

## OUR EVENTS

We run conferences and networking sessions for teachers and special classes for students.

## VCE Chemistry Resources

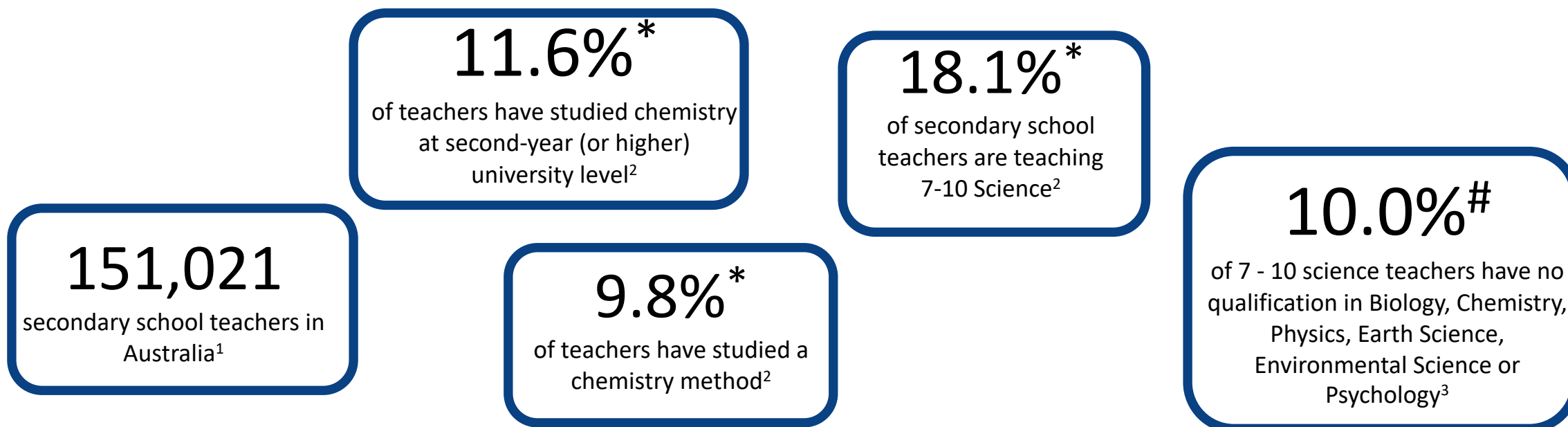
We have an extensive collection of material to help teach VCE Chemistry.

## Contact Us

Contact us to join or learn more!



# We're for OOF chemistry teachers too!



- \* and # percentages were determined pre-COVID times. These statistics are likely to be more pronounced now.
- Anecdotally, the CEA are engaging with a lot more OOF teachers of VCE chemistry, in-field teachers have expressed concerns about the extent of OOF teaching 7 – 10 Chemistry in their schools and the impact this has for student readiness and retention in VCE

<sup>1</sup>Australian Bureau of Statistics. *Schools* [Internet]. Canberra: ABS; 2022 [cited 2023 July 1]. Available from: <https://www.abs.gov.au/statistics/people/education/schools/latest-release>.

Other data from *Staff in Australian Schools Survey 2013*:  $n = 10,349$  secondary school teachers = 31.4 % response rate. In <sup>2</sup>Phillip McKenzie et. al. *Staff in Australian Schools Survey*, Canberra: ACER 2013, and <sup>3</sup>Paul Weldon, *Out-of-field teaching in Australian secondary schools*, Melbourne: ACER 2016.



# Drafting a format for the CEA TOOF PL program

Conversations with other subject organisations

- Barbara McKinnon (President) VicPhysics → immersive, small group
- Genevieve Newton (Executive Officer) and Paul Cross (Vice President), Geography Teachers Association of Victoria (GTAV) → diverse offerings to meet diverse needs

Our initial thinking → teachers would sign up for one term

- 1 x face-to-face day of hands-on learning and practical work (possibility of a hybrid option)
- 4 x 2 hr afterschool online tutorials addressing pedagogy and any point-of-need issues (approximately fortnightly)
- Create a cohort social networking app to create an ongoing support platform



# Getting input from in-field and OOF chemistry teachers

## CEA Out-Of-Field Teacher Survey: Professional Learning for Out-Of-Field Teachers Teaching the Year 7 - 10 Chemistry Curriculum

The Chemistry Education Association (CEA) is looking to develop a professional learning (PL) program for Year 7 - 10 Science teachers who feel they are 'Out-Of-Field' when teaching the chemistry curriculum. You may feel you are out-of-field if you trained in a science discipline other than chemistry or if your training (teaching or otherwise) wasn't science-specific.

We are keen to find out how we can structure this PL so that it can help participants to:

- feel more comfortable teaching chemistry concepts,
- feel more confident running chemistry practicals with your class, and
- maximise student engagement in your chemistry lessons.

This survey should take no more than 10 minutes to complete. Any personal details will remain confidential. Please view our privacy policy for more information: <https://www.cea.asn.au/privacy-policy>

If you are an in-field chemistry teacher and would like to provide recommendations to the CEA regarding this professional learning program, please follow this link to the 'in-field' teacher survey (green background): <https://forms.gle/J6vtmB1SgetdY7Fk8>

Thank you in advance for your valuable insights,

The CEA Committee

### Limitations:

- Survey was internally distributed, for the purposes of OOF program design
- Small sample size limited scope for descriptive statistical analysis
  - Out-of-field teachers (n = 16)
  - In-field teachers (n = 34)

What it means to be out-of-field

What we are hoping to achieve

Link to in-field teacher survey

## CEA In-Field Chemistry Teacher Survey: Professional Learning for Out-Of-Field Teachers Teaching the Year 7 - 10 Chemistry Curriculum

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We are keen to find out how we can structure this PL to specifically support out-of-field teachers. To do so, we would like to collect some information from in-field chemistry teachers. Not only do you have first-hand experience teaching chemistry from a position of expertise, but many of you also support your colleagues who are teaching 7 - 10 chemistry out-of-field. With your help, we aim to develop a PL program that helps PL participants teachers:

- feel more comfortable teaching chemistry concepts,
- feel more confident running chemistry practicals with your class, and
- maximise student engagement in your chemistry lessons.

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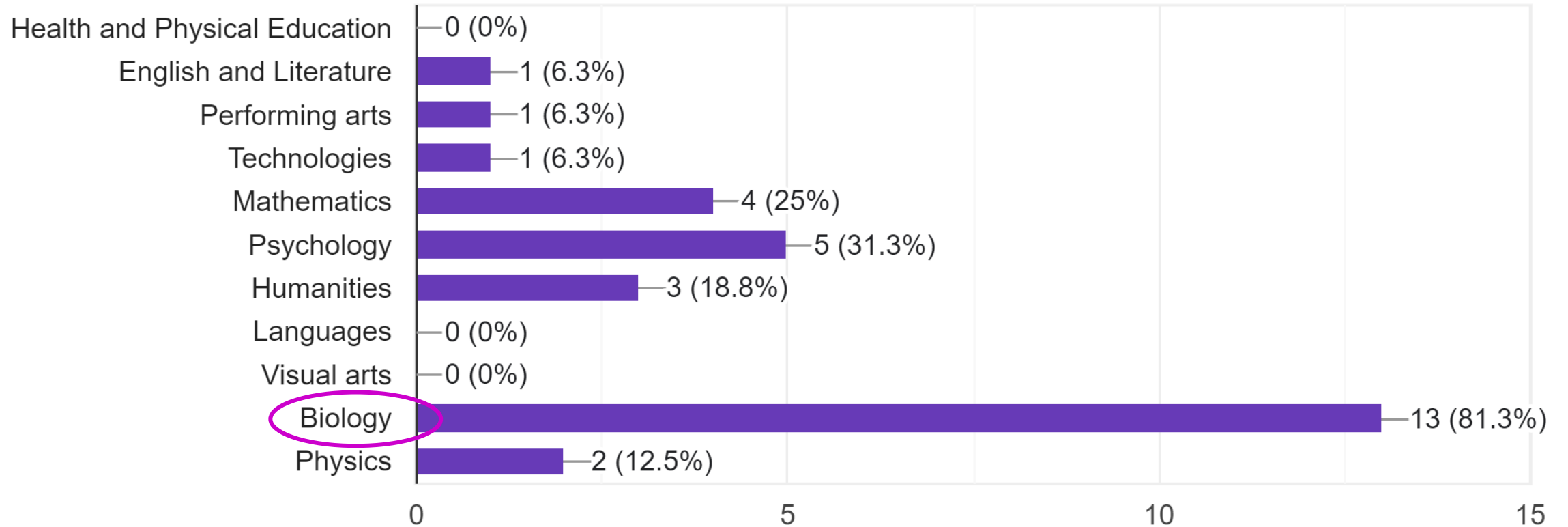
If you are 'out-of-field' for teaching chemistry and would like to provide recommendations to the CEA regarding this professional learning program, please follow this link to the 'out-of-field' teacher survey (purple background): <https://forms.gle/W7hSgpxQjwF7G2A>

Thank you in advance for your valuable insights,

The CEA Committee



# Distribution of disciplinary expertise in OOF teachers of 7 – 10 chemistry (n = 16)

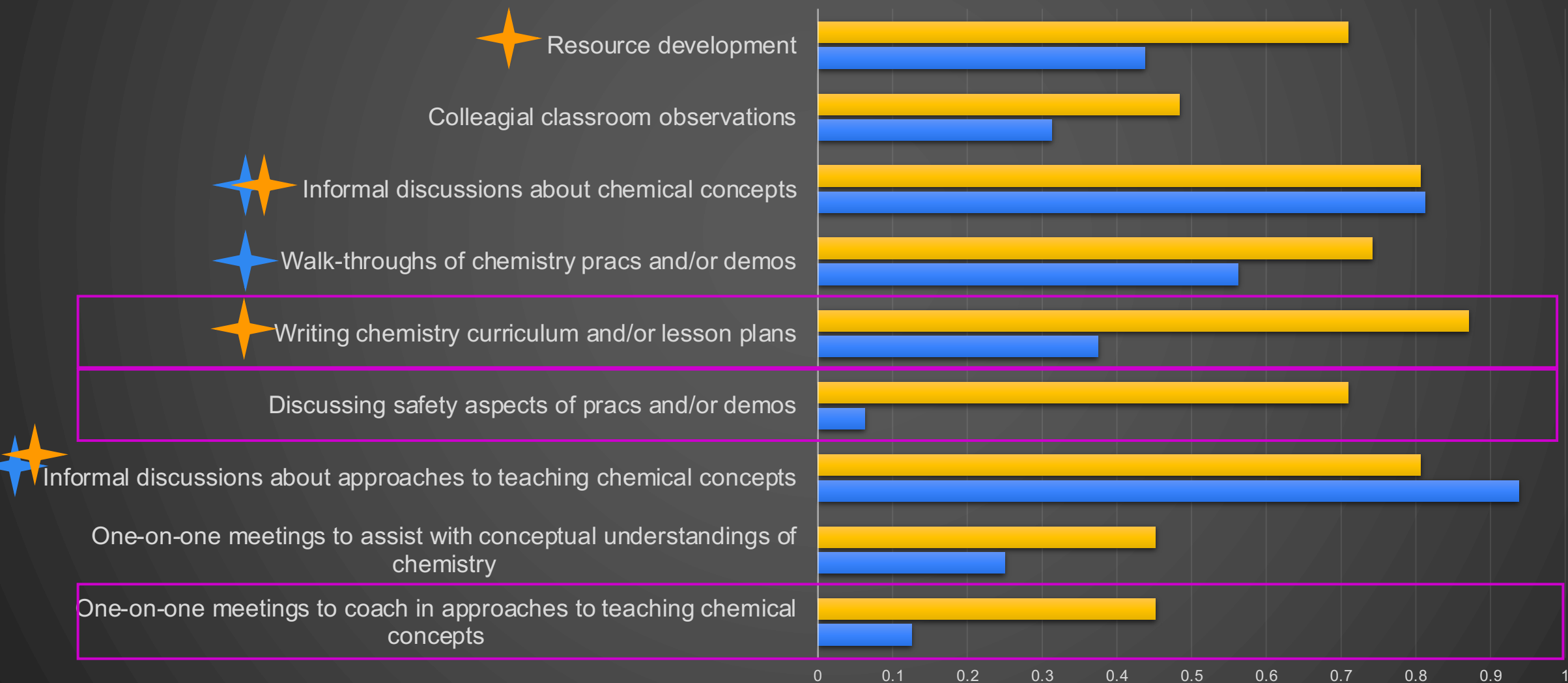




# Difference in perception of existing support for OOF teachers

■ Provided by in-field teachers

■ Received by out-of-field teachers

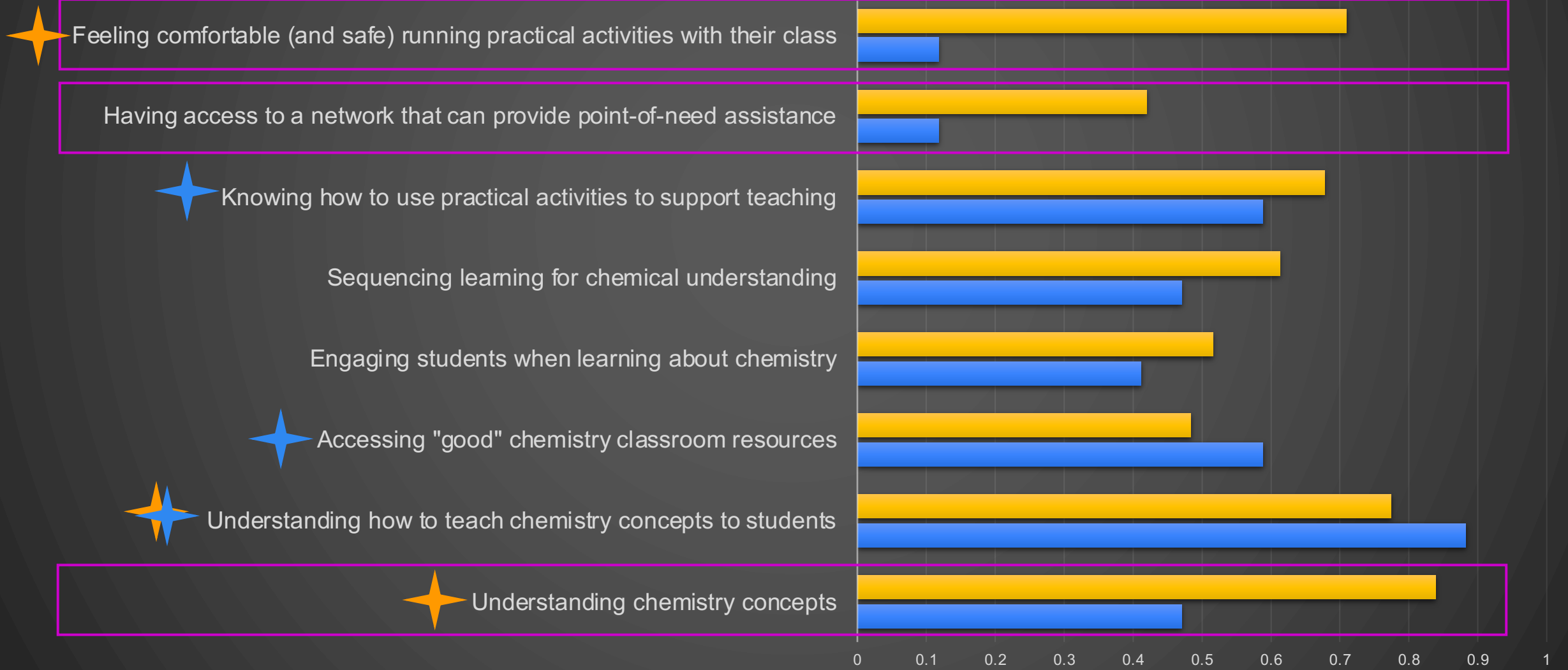




# Difference in perception of support OOF teachers need

■ Perception of in-field teachers

■ Out-of-field teachers





# Summary of results

## **OOF teacher** survey respondents

- mostly near OOF (13/16 Biology discipline)
- supported by their in-field colleagues through informal discussions of chemistry concepts and pedagogy
- need the most support with pedagogy for conceptual understanding and integrating prac work to support learning, as well as access to “good” resources

## **IF chemistry teacher** survey respondents

- predominantly supporting their OOF colleagues with resource development, curriculum and lesson planning, and informal discussions
- OOF teachers need the most support with safety during practical lessons, conceptual understanding and pedagogical understanding in chemistry



*I'm keen to get as much support as possible as I **love teaching Chemistry!***

*It's worth separating science and non-science out of field teachers*

*Would need to be offered remotely ... as I live too far from Melbourne to travel to these*

*Online PDs are awful.*

*We have figured out a lot on our own but **may have misconceptions**. My methods are close so I'd like to think that I've got it mostly down pat, but it's really hard to know how teaching chem in 7-10 is **going to impact student misconceptions** down the track. **Please do not be judgmental as other[s] are**, give us real, tangible strategies to work with.*



# New considerations for TOOF PL program design to include OOF teacher voice and choice

**Opt-in multi-faceted** program that offers voice and choice to OOF teachers

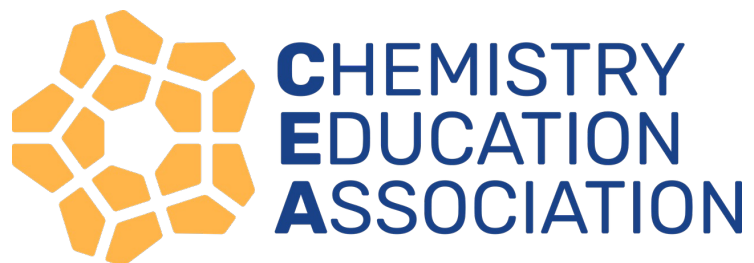
- Ongoing consultation with teachers regarding chemistry PL needs
- Sign up for as long as you need – one off or continued engagement
- Online seminars/workshops to tackle ‘big ideas of chemistry’, inclusive of conceptual understanding and pedagogy (two per term, larger group)
- Developing and curating teaching resources accessible online aligned to ‘big ideas of chemistry’ seminars
- 1 day face-to-face focused on practical work, practical pedagogy, and safety (small groups)
  - regional area delivery to support non-metro teachers/hybrid with posted prac kits
- “Just in time” online support network facilitated by an experienced chemistry teacher (small groups)
  - regional groupings





## Next steps for the CEA

- Staged implementation
  - 2024: Online “big ideas of chemistry” seminars/workshops and resources
  - 2025: 1-day face-to-face practical program and mentor groups
- Refining the approach
  - Using the TOOF research to develop templates for content creators and seminar facilitators
- Recruitment
  - Finding experienced chemistry teachers to support OOF chemistry teachers



# Thank you

[lisa.chiavaroli@monash.edu](mailto:lisa.chiavaroli@monash.edu)

[s.delaney@deakin.edu.au](mailto:s.delaney@deakin.edu.au)



**MONASH**  
University

