

Hendra Y. Agustian  
 Assistant professor, tenure track, Tenure Track Assistant Professor  
 Department of Science Education  
 Department of Science Education  
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## Short presentation

### Background

I have degrees in chemistry, education, and chemistry education from universities in the United Kingdom, the Netherlands, Czech Republic, and Indonesia. My professional background as a school teacher, curriculum coordinator, workshop leader, and educational researcher in international schooling dovetails my perpetual interest in science and science education. I have been working in the education sector since 1999, and for the past 8 years, I have been diligently building an expertise in laboratory education research at the university level, with a strategic focus on multidimensional learning.

### Programmes

My research programmes are centred on epistemic orientations in higher science education. Within the line of research in laboratory education, I investigate various aspects of student learning during experimental work conceptualised as epistemic practice, viz. epistemic affect, conation (in an Aristotelian perspective), embodied and epistemic cognition, multimodality, and materiality. I also develop a theoretical framework and working model for the integration of six domains of learning in the lab, mainly informed by science studies and the learning sciences. In the IQ-Lab research project, I have led a work package focussed on systematic review of empirical literature and faculty's deliberation of student learning.

Accordingly, I explore historical narratives in this area, particularly on justifications for instruction in the lab of physical and chemical sciences drawn from original texts by the likes of Maxwell, Kelvin, and Liebig.

In the near future, the programme will be geared towards elucidation of epistemic practices in higher science education. I am interested in investigating wicked problems and how they should be addressed in HE curriculum and instruction, partly by a conceptual framing in post-normal science education. I also seek to look closer into science teacher education as a vital agent by which alignment can be better forged between scientific and lay communities.

Inspired by my previous engagement in inclusive education and special education needs, I also aim to address inequities in higher science education, primarily in terms of access and learning opportunities. I am interested in recontextualisation of universal design for learning and institutional efforts to develop inclusion. I have worked and published in the field of international education and seek future collaboration opportunities, particularly related to internationalisation of curricula, inclusive practices, and cultural dissonance.

### Methodological Interests

Philosophical inquiry

(Quantitative) ethnography

Structural equation modelling

Epistemic network analysis

Artefact-based cognitive focus groups

Multimodal discourse analysis

Hermeneutic phenomenology

Grounded theory

Critical policy analysis

Educational design research

Mixed methodology

Systematic review

Research synthesis

Historical narrative analysis

## Teaching and Supervision

I teach courses in science didactics (preservice teachers) and university pedagogy (PhDs, postdocs, faculty, medical professionals). I also lead workshops in laboratory education (faculty, laboratory assistants and technicians). In the past, I taught in laboratories of general and environmental chemistry. Prior to my current focus on post-secondary education, I taught mathematics and chemistry at the primary and secondary levels. I also led workshops in K-12 curriculum development, primarily within curricular frameworks of International Baccalaureate and Cambridge International Examination. In my current role, I supervise students' projects in the field of chemistry education, practical work at tertiary level, and philosophy of chemistry as applied to instruction and curriculum development.

## Pedagogical Development

I am keen on supporting scholarship of teaching and learning within SCIENCE and SUND, particularly the ones focussed on inquiry-based, research-based, and problem-based frameworks. I have been exploring the role of and various approaches to interactive demonstrations in those frameworks, the use of dialogic, discursive feedback, as well as fostering reflective practice in teaching. I work with colleagues from both physical and chemical sciences, and am keen on providing professional consultancy which is strongly anchored in research. My experience working at the Netherlands Institute for Curriculum Development provides a robust foundation for development work related to higher science education curricula and strategic policies.

## Academic Service

I serve on the Editorial Board of *Journal of Research in Science Teaching* (Wiley) and the scientific committee of the *International Conference on Chemistry Education* (IUPAC). I have peer-reviewed in various journals, including *Chemistry Education Research and Practice* (Royal Society of Chemistry), *Higher Education* (Springer), *Journal of Chemical Education* (American Chemical Society), and *International Journal of Science Education* (Taylor & Francis).

## Hobbies

In my spare time, I sing in choirs, working on a vaudeville of repertoire ranging from Tallis to Macmillan, von Bingen to Stravinsky. I was a choral scholar at an Edinburgh cathedral and currently sing with Vokalensemble Willemoes in Copenhagen.

## Qualifications

Chemistry Education, PhD, The University of Edinburgh, Scotland, UK.

Sep 2016 → Dec 2019

Award Date: 3 Feb 2020

## Employment

### Assistant professor, tenure track

Department of Science Education

København N., Denmark

30 Nov 2019 → nu

### Tenure Track Assistant Professor

Department of Science Education

København N., Denmark

1 Dec 2019 → nu

## Research outputs

### Pupil's role in educational design: Exploring what it means to have a say in primary school

Agustian, Hendra Y., 15 May 2024, (E-pub ahead of print) In: *European Journal of Education*.

### "I feel like a real chemist right now": Epistemic affect in the chemistry laboratory

Agustian, Hendra Y., Gammelgaard, Bente, Rangkuti, Muhammad Aswin & Niemann, Jonas, Mar 2024, (Submitted) In: *Science Education*.

### Striving to learn to do good science: Epistemic conation in the chemistry laboratory

Agustian, Hendra Y., Gammelgaard, Bente, Rangkuti, Muhammad Aswin & Ryberg, Marie L., Mar 2024, (In preparation) In: *Science & Education*.

### 10 Guiding principles for learning in the laboratory

Seery, M. K., Agustian, Hendra Y., Christiansen, Frederik Voetmann, Gammelgaard, Bente & Malm, Rie Hjørnegaard, 2024, In: *Chemistry Education Research and Practice*. 25, 2, p. 383-402

**On problematizing the epistemic and axiological nexus of post-normal science education**  
Agustian, Hendra Y., Nov 2023, (Accepted/In press).

**Methodological rigor in laboratory education research**  
Agustian, Hendra Y., Oct 2023, (Submitted) In: Laboratories.

**The critical role of understanding epistemic practices in science teaching using wicked problems**  
Agustian, Hendra Y., Sep 2023, (E-pub ahead of print) In: Science & Education.

**Demonstrations as a part of inquiry-based science teaching: Potentials and critical reflections**  
Agustian, Hendra Y., Aug 2023, (Submitted) In: Dansk Universitetspædagogisk Tidsskrift.

**Use QE to disentangle the complexity of wicked problem inquiries in USE**  
Agustian, Hendra Y., Jul 2023, (Accepted/In press).

**Wicked problems inquiries in higher science education: Philosophical analysis and pedagogical implications**  
Agustian, Hendra Y., Jul 2023, (Accepted/In press).

**Advancing the conception of multidimensional learning: Insight from theoretical and empirical investigations on laboratory education**  
Agustian, Hendra Y., 2023. 2 p.

**Enculturation of pharmacy students into scientific practices: a closer look into affect and conation in the laboratory of pharmaceutical sciences**  
Agustian, Hendra Y. & Gammelgaard, Bente, 2023. 4 p.

**Multidimensional learning as a theoretical lens**  
Agustian, Hendra Y. & Gane, B. D., 2023, (In preparation) In: European Journal of Education.

**Synthesizing and contextualizing knowledge on teaching and learning in the laboratory: Perspectives from Copenhagen and Edinburgh**  
Agustian, Hendra Y., 2023. 1 p.

**Synthesizing and contextualizing knowledge on teaching and learning in the laboratory: Perspectives from Copenhagen and Edinburgh**  
Agustian, Hendra Y., 2023. 1 p.

**Understanding the teaching laboratories: Moving from research to practice**  
Agustian, Hendra Y., Finne, Laura Teinholt, Jørgensen, Jonas Tarp, Malm, Rie Hjørnegaard, Christiansen, Frederik Voetmann, Nielsen, Jan Alexis & Gammelgaard, Bente, 2023. 1 p.

**Understanding the teaching laboratories: Moving from research to practice**  
Agustian, Hendra Y., Finne, Laura Teinholt, Jørgensen, Jonas Tarp, Malm, Rie Hjørnegaard, Christiansen, Frederik Voetmann, Nielsen, Jan Alexis & Gammelgaard, Bente, 2023. 1 p.

**Considering the hexad of learning domains in the laboratory to address the overlooked aspects of chemistry education and fragmentary approach to research on student learning**  
Agustian, Hendra Y., 2022, In: Chemistry Education Research and Practice. 23, 3, p. 518-530 13 p.

**Danish university faculty perspectives on student learning outcomes in the teaching laboratories of a pharmaceutical sciences education**  
Agustian, Hendra Y., Pedersen, M. I., Finne, Laura Teinholt, Jørgensen, Jonas Tarp, Nielsen, Jan Alexis & Gammelgaard, Bente, 2022, In: Journal of Chemical Education. 99, 11, p. 3633-3643

**Laboratory discourse through the lens of multidimensional learning**

Agustian, Hendra Y. & Gammelgaard, Bente, 2022. 1 p.

**Laboratory work as an epistemic practice: Discursive characteristics of student learning in the pharmaceutical chemistry teaching laboratory**

Agustian, Hendra Y. & Gammelgaard, Bente, 2022. 2 p.

**Learning outcomes of university chemistry teaching in laboratories: A systematic review of empirical literature**

Agustian, Hendra Y., Finne, Laura Teinholt, Jørgensen, Jonas Tarp, Pedersen, M. I., Gammelgaard, Bente, Christiansen, Frederik Voetmann & Nielsen, Jan Alexis, 2022, In: Review of Education. 10, 2, 41 p., e3360.

**Rhetoric and reality of inclusive practice in international schooling**

Agustian, Hendra Y., 2022, p. 440-441.

**Investigating inclusive practice in international schooling: A case study of two schools**

Agustian, Hendra Y., Dec 2021, In: Journal of Research in International Education. 20, 3, p. 226-241 16 p.

**Experimental work and student learning: University professors' perspective**

Agustian, Hendra Y., 2021. 2 p.

**Laboratory-related competences at university level: Systematizing empirical literature and expert validation**

Agustian, Hendra Y., Nielsen, Jan Alexis & Pedersen, M. I., 2021. 4 p.

**Students' learning experience in the chemistry laboratory and their views of science: In defence of pedagogical and philosophical validation of undergraduate chemistry laboratory education**

Agustian, Hendra Y., Mar 2020

**Students' understanding of the nature of science in the context of an undergraduate chemistry laboratory.**

Agustian, Hendra Y., 2020, In: Electronic Journal for Research in Science & Mathematics Education. 24, 2, p. 56-85

**A Framework for Learning in the Chemistry Laboratory**

Seery, M. K., Agustian, Hendra Y. & Zhang, X., 2019, In: Israel Journal of Chemistry. 59, 6-7, p. 546-553

**Students' understanding of the nature of science in the chemistry laboratory context**

Agustian, Hendra Y., 2019.

**Systematic review of research in the nature of science, 1963-2019: Towards a pedagogically and philosophically valid undergraduate laboratory education**

Agustian, Hendra Y. & Seery, M. K., 2019.

**Teaching and assessing technical competency in the chemistry laboratory**

Agustian, Hendra Y., Seery, M. K. & Lambert, T. O., 2019, *Teaching Chemistry in Higher Education: A Festschrift in Honour of Professor Tina Overton*. Seery, M. K. & McDonnell, C. (eds.). Dublin: Creathach Press, p. 349-362

**Pre-laboratory activities in undergraduate chemistry: Design and evaluation**

Agustian, Hendra Y., Aug 2017.

**Developing laboratory skills by incorporating peer-review and digital badges**

Seery, M. K., Agustian, Hendra Y., Doidge, E. D., Kucharski, M. M., O'Connor, H. M. & Price, A., 1 Jan 2017, In: Chemistry Education Research and Practice. 18, 3, p. 403-419 17 p.

**Reasserting the role of pre-laboratory activities in chemistry education: A proposed framework for their design**  
Agustian, Hendra Y. & Seery, M. K., 1 Jan 2017, In: Chemistry Education Research and Practice. 18, 4, p. 518-532 15 p.

**Redefining disability in the context of 'masyarakat madani', an Indonesian model of inclusive society**  
Agustian, Hendra Y., 1 Dec 2016, In: British Journal of Special Education. 43, 4, p. 358-372 15 p.

**De rol van de kinderen bij vormgeving in het onderwijs**  
Agustian, Hendra Y., 2014, (Unpublished)

## Activities

**Nordic Chemistry Learning Conference 2024**  
Agustian, Hendra Y. (Member of organizing or programme committee)  
23 Sep 2024 → 24 Sep 2024

**Foregrounding the epistemic core of experimental work in university chemistry teaching laboratories**  
Agustian, Hendra Y. (Keynote)  
Sep 2024

**Teaching to learn to do chemistry in the laboratory**  
Agustian, Hendra Y. (Invited speaker)  
Sep 2024

**The 27th International Union of Pure and Applied Chemistry (IUPAC) Conference on Chemistry Education**  
Agustian, Hendra Y. (Member of organizing or programme committee)  
15 Jul 2024 → 19 Jul 2024

**Recent advances in chemistry laboratory education research**  
Agustian, Hendra Y. (Invited speaker)  
Jul 2024

**The value and meaning of STEAM education + Anna Craft Memorial Lecture**  
Agustian, Hendra Y. (Panel member)  
Jul 2024

**Teaching in the laboratory: what is the pedagogy?**  
Agustian, Hendra Y. (Invited speaker)  
18 Apr 2024

**Journal of Research in Science Teaching (Journal)**  
Agustian, Hendra Y. (Member of Editorial Board)  
Apr 2024 → Apr 2027

**Review of Educational Research (Journal)**  
Agustian, Hendra Y. (Peer reviewer)  
Apr 2024 → May 2024

**#TownsFest: A Celebration of Professor Marcy Towns**  
Agustian, Hendra Y. (Invited speaker)  
11 Jan 2024

**Science Education (Journal)**  
Agustian, Hendra Y. (Peer reviewer)  
Nov 2023 → Dec 2023

**Science & Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Oct 2023 → Nov 2023

**Teaching and Teacher Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Oct 2023

**ESERA paper presentation on the affective and conative learning domains in the lab**

Agustian, Hendra Y. (Speaker)

1 Sep 2023

**Pedagogical Day at Pharma**

Seery, M. (Speaker), Gammelgaard, Bente (Organizer), Agustian, Hendra Y. (Member of organizing or programme committee) & Christiansen, Frederik Voetmann (Member of organizing or programme committee)

24 Aug 2023

**Chemistry Education Research and Practice (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Aug 2023

**Journal of Chemical Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Aug 2023

**Research synthesis and work in progress**

Agustian, Hendra Y. (Speaker)

9 Jul 2023 → 14 Jul 2023

**Higher Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Jul 2023

**International Journal of Educational Research (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Jul 2023 → Aug 2023

**Review of Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Jul 2023 → Sep 2023

**10 Guidelines to Improve Laboratory Education**

Agustian, Hendra Y. (Speaker) & Christiansen, Frederik Voetmann (Speaker)

8 Jun 2023

**Paper and poster presentations from the IQ-Lab**

Agustian, Hendra Y. (Speaker), Gammelgaard, Bente (Other), Christiansen, Frederik Voetmann (Speaker), Malm, Rie Hjørnegaard (Speaker), Finne, Laura Teinholt (Other) & Jørgensen, Jonas Tarp (Other)

24 May 2023 → 25 May 2023

**Bachelor's Project Examination**

Agustian, Hendra Y. (Examiner)

14 Apr 2023

**International Journal of Science Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Feb 2023 → Sep 2023

**Science Didactics Examination**

Agustian, Hendra Y. (Examiner)

24 Jan 2023

**DUN SIG Seminar on Labwork and Fieldwork**

Christiansen, Frederik Voetmann (Organizer), Agustian, Hendra Y. (Organizer), Gammelgaard, Bente (Organizer) & Magin, L. (Organizer)

7 Dec 2022

**Journal of Educational Research (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Dec 2022

**University of Oxford**

Agustian, Hendra Y. (Visiting researcher)

26 Nov 2022 → 5 Dec 2022

**Seminar Series on University Laboratory Education**

Agustian, Hendra Y. (Organizer) & Malm, Rie Hjørnegaard (Organizer)

23 Nov 2022 → 28 Mar 2023

**Teaching for Active Learning Conference 2022**

Agustian, Hendra Y. (Participant)

8 Nov 2022

**ESERA SIG 2 Video-Based Research Network Meeting**

Agustian, Hendra Y. (Participant)

7 Nov 2022 → 11 Nov 2022

**Journal of Chemical Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Oct 2022

**Department of Science Education Annual Seminar**

Nielsen, Jan Alexis (Organizer), Larsen, Christina (Organizer), Harper, Kristine Cecile (Organizer), Klingenberg, L. (Organizer) & Agustian, Hendra Y. (Organizer)

21 Sep 2022 → 22 Sep 2022

**International Journal of Science Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Sep 2022

**Complexity of laboratory learning outcomes: Examples of educational research at Pharma**

Agustian, Hendra Y. (Speaker), Jørgensen, Jonas Tarp (Speaker) & Gammelgaard, Bente (Other)

31 Aug 2022

**New faculty meeting**

Agustian, Hendra Y. (Participant)

19 Aug 2022

**Chemistry Education Research and Practice (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Aug 2022

**Discursive characteristics of student learning in the pharmaceutical chemistry teaching laboratory**

Agustian, Hendra Y. (Speaker) & Gammelgaard, Bente (Other)

18 Jul 2022 → 22 Jul 2022

**Bachelor's Project Examinations**

Agustian, Hendra Y. (Examiner)

22 Jun 2022 → 23 Jun 2022

**Research Visit**

Agustian, Hendra Y. (Host) & Ryberg, Marie L. (Host)

10 Jun 2022

**Rhetoric and reality of inclusive practice in international schooling**

Agustian, Hendra Y. (Speaker)

1 Jun 2022 → 3 Jun 2022

**American Chemical Society (External organisation)**

Agustian, Hendra Y. (Member)

Apr 2022 → ...

**Special Interest Group Meeting in Laboratory Work and Fieldwork**

Agustian, Hendra Y. (Other)

21 Mar 2022

**Nordic Educational Research Association (NERA) (External organisation)**

Agustian, Hendra Y. (Member)

Mar 2022 → ...

**Journal of Research in Science, Mathematics and Technology Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Feb 2022 → Mar 2022

**Progression in laboratory competences in the Physics BSc Program**

Christiansen, Frederik Voetmann (Consultant) & Agustian, Hendra Y. (Consultant)

Feb 2022 → Oct 2022

**Science Didactics Examination**

Agustian, Hendra Y. (Examiner)

24 Jan 2022 → 27 Jan 2022

**Practical work in university pedagogy**

Agustian, Hendra Y. (Lecturer)

25 Nov 2021

**Learning in the lab – How can we strengthen our teaching activities to enhance the students learning?**

Agustian, Hendra Y. (Lecturer)

9 Nov 2021



**Experimental work and student learning: University professors' perspective**

Agustian, Hendra Y. (Speaker)

8 Oct 2021

**Laboratory education at university level: Philosophy, pedagogy, and practice**

Agustian, Hendra Y. (Invited speaker)

1 Sep 2021

**Journal of Chemical Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Sep 2021

**Journal of Chemical Education (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Aug 2021

**Multidimensionality of learning in the laboratory: Insights from a systematic review**

Agustian, Hendra Y. (Speaker)

8 Mar 2021

**Science Didactics Examination**

Agustian, Hendra Y. (Examiner)

Jan 2021

**Dansk Universitetspædagogisk Tidsskrift (Journal)**

Agustian, Hendra Y. (Peer reviewer)

Oct 2020 → Dec 2020

**Workshop on learning framework in the laboratory**

Agustian, Hendra Y. (Consultant) & Christiansen, Frederik Voetmann (Consultant)

29 Jun 2020

**Dansk Universitetspædagogisk Netværk (DUN) (External organisation)**

Agustian, Hendra Y. (Member)

Mar 2020 → ...

**Prelaboratory activities in the teaching laboratory**

Agustian, Hendra Y. (Invited speaker)

26 Feb 2020

**Students' learning in the chemistry laboratory and their views of science**

Agustian, Hendra Y. (Speaker)

25 Feb 2020

**American Educational Research Association (External organisation)**

Agustian, Hendra Y. (Member)

Sep 2019 → Jan 2021

**European Science Education Research Association (External organisation)**

Agustian, Hendra Y. (Member)

Sep 2019 → ...

**North American Association for Philosophy and Education (External organisation)**

Agustian, Hendra Y. (Member)

Jun 2019 → Jun 2020

**Students' understanding of the nature of science in undergraduate chemistry laboratory education**

Agustian, Hendra Y. (Speaker)

31 May 2019

**Royal Society of Chemistry (External organisation)**

Agustian, Hendra Y. (Member)

May 2019 → May 2021

**Philosophy of Education Society Great Britain (External organisation)**

Agustian, Hendra Y. (Member)

Feb 2019 → Feb 2020

**Pre-laboratory activities in undergraduate chemistry: Design and evaluation**

Agustian, Hendra Y. (Speaker)

16 Aug 2017 → 19 Aug 2017

**Internationalisation of secondary education in the Netherlands**

Agustian, Hendra Y. (Invited speaker)

Aug 2012

**Inclusive practice in international schooling**

Agustian, Hendra Y. (Speaker)

24 Jun 2010