

Hendra Y. Agustian
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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., 30 Apr 2024, (Accepted/In press) 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, 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.

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