

# **INTERDISCIPLINARY COLLABORATION TO MAKE MATHEMATICS RELEVANT AND ENGAGING FOR STEM STUDENTS**

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## **OVERVIEW OF WORKSHOP**

Students' achievement in STEM-related subjects continues to be a major challenge in the quest of achieving SDG4. A scientific American publication [1] discusses how only a fraction of students ultimately complete a STEM degree and cites research [2] that identifies disengagement with mathematics as a leading cause of the student's poor achievement and dropout rate. It then highlights examples of several promising reforms and recommends that STEM faculty take the lead in introducing enhancements by collaborating and co-creating across disciplines to make mathematics more relevant and interesting to STEM students. With this in mind, the aims of the workshop are to:

- create a Community of Practice (COP) in the teaching and learning of mathematics for STEM students incorporating CDIO principles
- encourage discussions and the sharing of best practices among workshop participants.
- invite case studies of current implementations and work in progress from different contexts/countries to develop a future framework to support the teaching of mathematics for STEM students.

## **KEYWORDS**

Co-creation, Interdisciplinary Learning, Real-life Applications, Standards: 1,2,3,6,7,8,9,10,11

## **DURATION**

The authors would prefer to run a workshop of 120 minutes.

## **ACTIVITIES**

The workshop will consist of the following parts, with participants actively enrolled in parts 1, 4 and 5:

1. Collect participants' expectations using pen-and-paper or digital tools (5-10 mins)
2. Introduce the workshops' rationale and objectives: creating a COP of math integration in different countries/contexts and sharing best practices with the aim of compiling a report (5-10 mins)
3. Presentation of current initiatives undertaken by the workshop facilitators in their various institutions (20 mins)
4. Group reflection on the presentations and planning future activities (45 mins)
5. Concluding remarks (20 mins)

## **TARGET AUDIENCE**

Practitioners, instructors, researchers, and learning designers of mathematics for STEM students who would like to be part of a community sharing best practices.

## **OUTCOMES**

1. Introduce a COP amongst CDIO members interested in the teaching of mathematics for STEM
2. Collect case studies showcasing a variety of examples for different contexts to compile for a future report
3. Develop evidence-based tools for teacher and faculty professional development
4. Support Math/STEM Faculty/Teachers in co-disciplinary teaching

## **REFERENCES**

1. Burdman, P. To Keep Students in STEM fields, Let's Weed Out the Weed-Out Math Classes. March 15, 2022.
2. Hunter, A.-B., et al., Talking about Leaving Revisited: Persistence, Relocation and Loss in Undergraduate STEM Education. Forthcoming 2019 Springer. Editors, Anne-Barrie Hunter and Elaine Seymour. 2019.

## BIOGRAPHICAL INFORMATION

**Ernest Ampadu** is an Associate Professor at the Department of Learning, Royal Institute of Technology (KTH). His research focus is on the area of students learning experiences and teachers' professional development.

**Salim Mohamed Salim** is an Associate Professor and Director of International Partnership at, Faculty of Science and Engineering, Swansea University. He is a Chartered Engineer and Senior Fellow of the Higher Education Academy. His pedagogical interests include student-centred, research-led, and active learning, with an emphasis on the real-life applications of engineering skills and knowledge.

**Hanne Deprez** is a postdoctoral researcher, investigating integrated STEM (iSTEM) education at KU Leuven. Trained as an engineer, she is responsible for the courses Didactics and Internship of Interdisciplinary STEM education in the Master of Teaching in sciences and technology. Her research interests are focused on integrated approaches to and conceptual learning in STEM secondary education and pre-service STEM teacher training.

**Elizabeth Keller** is a Lecturer at the Department of Learning in Engineering Sciences, Royal Institute of Technology (KTH). Her interests include the development of young faculty and have been involved in different initiatives within the CDIO community.

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