

CALL FOR CHAPTER PROPOSALS

Proposal Submission Deadline: September 30, 2020

Book title: Reforming Science Teacher Education Programs in the STEM Era: International practices

We would like to invite researchers and practitioners to contribute a chapter to a volume we are co-editing. We are planning to place this volume in the series “*Palgrave Studies on Leadership and Learning in Teacher Education*” (<https://www.springer.com/series/16190>). Initial communication with the series editors have indicated a strong interest and we are now at the stage of putting together a list of authors and abstracts to finalize an agreement with Palgrave Macmillan.

Researchers and practitioners who are interested in contributing to this book are invited to submit the following on or before *September 30, 2020*:

1. A Working title for the proposal
2. A 500-word manuscript proposal in Microsoft Word
3. For each contributing author provide:
 - Name, title, current position, affiliation and email
 - 3-4 sentence biographical blurb of each contributing author
 - one page list of key publications by each contributing author

Send your proposal to sbalushi@squ.edu.om; Lisa.Martin@csulb.edu; YoungJin.Song@csulb.edu

Editors,

- *Sulaiman M. Al-Balushi*, Professor of Science Education, Sultan Qaboos University, Muscat, Oman
- *Lisa Martin-Hansen*, Professor of Science Education, California State University, Long Beach, California, USA
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Reforming Science Teacher Education Programs in STEM Era: International practices

Overview:

Globally, programs in STEM (Science, Technology, Engineering and Mathematics) education have been established reshaping science education for more than two decades. One way or another, STEM education

has influenced science education standards, designs and practices. STEM has been practiced around the globe in different schools and universities and often in different ways. New school curricula, extra-curricular programs, instructional methods, university programs and professional development programs for in-service teachers have been created. The definitions, assumptions, themes and mechanisms of STEM education have been changing and transforming over the years and differ across different STEM education communities. Although there are four main fields that are involved in STEM education, (i.e. Science, Technology, Engineering and Mathematics) educational generalists (such as elementary teachers) or secondary level science teachers have been considered by policy makers to be the main implementers of STEM-related initiatives. Consequently, teacher preparation institutions have reformed their programs of preparing science teachers differently. The current book presents a variety of different international practices in reforming science teacher education programs to respond to STEM education.

Objectives of the book:

1. To inform educators of different international and cultural practices in redesigning teacher education programs that prepare science teachers in response to the progressive development in STEM education.
2. To provide teacher educators with alternative means practiced by international institutions to align their science teacher education programs to STEM education.
3. To understand how different international institutions interpret STEM education during a redesign of their science teacher education programs. Are there considerations regarding culture?
4. To illustrate the major differences between STEM-based teacher education programs and single-science field programs.
5. To identify types of resources needed for science teacher education programs to prepare science teachers to teach in STEM classrooms.
6. To trace the impact that the STEM-based teacher education programs make on the teaching and learning of science.

The book is divided into two main parts. Part 1 helps the reader to gain an insight of STEM education that is necessary to understand the international practices presented in the next part. Part 2 illustrates practices of higher education institutions from different countries around the globe in reforming science teacher education programs in response to STEM education.

Part 1: STEM education and science education:

Overview: this part discusses what STEM education is. It provides the reader with different definitions of STEM found in the literatures and discusses how STEM has been interpreted differently. This part also illustrates the alignment between STEM and the Next Generation Science Standards (NGSS) which is the most recent science education standards in the United States. The first part of the book also presents different reform initiatives in science curriculum and demonstrates different classroom practices in STEM classrooms. The following are the four proposed chapters for Part 1:

1. STEM Education: An overview (written by co-editors)
2. How the Next Generation Science Standards (NGSS) support STEM education in the United States
3. Science curriculum reforms in response to STEM education trends, policies, or initiatives
4. Science teachers' practices in STEM classrooms

Part 2: International practices in reforming science teacher education programs in response to STEM:

Overview: The 2nd part of the book illustrates different international practices in redesigning teacher education programs that prepare science teachers in response to the continuous development in STEM education. It also provides teacher educators with alternative means that are practiced by international institutions to align their science teacher education programs to STEM education. The second part of the book also discusses different examples of how **international institutions interpret STEM education when they redesign their science teacher education programs**. Furthermore, it illustrates the major differences between STEM-based teacher education programs and regular programs in terms of taught courses, pedagogical knowledge and skills and practical experiences. Part 2 also presents different types of resources needed for science teacher education programs to prepare science teachers to teach in STEM classrooms. The potential impact of the STEM-based teacher education programs on the teaching and learning of science is also discussed. The proposed chapters for Part 2 are:

Teacher education programs attempting to implement STEM in universities or other teacher-certificate granting institutions from those world regions.

5. North America (US, Canada, Mexico)
6. Central America and the Caribbean (such as Costa Rica, Cuba, Guatemala, Dominica, Jamaica)
7. South America (such as Argentina, Brazil, Chile, Colombia)
8. Oceania (such as Australia, Papua New Guinea, New Zealand)
9. Europe and/or European Union (such as Turkey, Switzerland, Russia, UK, Finland)

10. Middle East (such as Oman, Lebanon, Saudi Arabia)
11. Africa (such as Egypt, Kenya, Nigeria, South Africa, Sudan)
12. Asia (such as Taiwan, South Korean, Singapore, Japan, India, China, Philippines)

Note: The chapter could cover a country or a number of countries.

Each of these chapters will cover all or some of the following items:

1. The conceptual framework (and definition) of STEM that the institution has adopted to transform its science teacher education program – with particular attention to integration vs. discipline-specific STEM components.
2. The major driver of why/how the program changes over time (policy, research, funding, government pressure, other)
3. The design of the major components of the program: content and pedagogical courses and clinical experience (especially call attention to unique or innovative approaches). The major changes done on the program to transform it to become STEM-based. Describe STEM-based experiences provided to student teachers in the program.
4. The alignment between the teacher preparation program and STEM education – both teacher preparation and goals of student learning with children ages 4-18.
5. Types of resources needed to prepare science teachers to teach in STEM classrooms.
6. The impact (when possible) of the STEM-based program and its graduates on the teaching and learning of science in schools.
7. Other important aspects of the program.

Guidelines to prospective authors:

1. The chapter should focus on either part 1 or part 2 of the book as described above
2. The length of each chapter should be of 5000 words maximum (including reference list, charts and tables)
3. There are no methodological restrictions. We welcome contributions of a theory-based, conceptual nature, narrative inquiry, policy analysis, primary or secondary data analysis, critical reflection, quantitative, qualitative or mix methods research-based work
4. APA referencing style should be used throughout the chapter. Thorough consideration to referencing of sourced materials should be maintained

5. The submission of the chapter implies that it has not have been published previously and that it is not currently under consideration for publication elsewhere
6. The submitted chapters are to be subjected to peer review

Timeline:

- Call for proposals: 20th August 2020
- 500-word Proposal submission deadline: 30th September 2020
 - Proposed chapter overviews should be 500 word in length, APA version 6 format, written in a narrative style. The proposal should include a proposed title of the chapter, a statement of objectives, methodology, and (expected) key findings with regard to STEM-based teacher education program. This is submitted along with 3-4 sentence biographical blurb of each contributing author and one page list of key publications by each contributing author
- Notification of initial acceptance of proposals (to chapter authors): 30th October 2020
- Notification of final acceptance of proposals (to chapter authors): December 2020
- Completed chapter submission: 15th June 2021
- Blind peer review start: 15th July 2021
 - We will use an internal review process, so each author reads other chapters to provide constructive feedback/critique. As editors we will also review each chapter and add our own comments if necessary.
- Authors receive review feedback: 15th September 2021
- Revised chapter submission: 15th November 2021
 - The editors will check whether the authors did the required modifications, and the authors would receive a second editorial review if necessary.
- Final chapter submission: 31ST January 2022
- Book submission to series editors: 30th March 2022
- Authors may receive further review feedback based on the review that will be done by the series editors and the publisher: 30th June 2022