

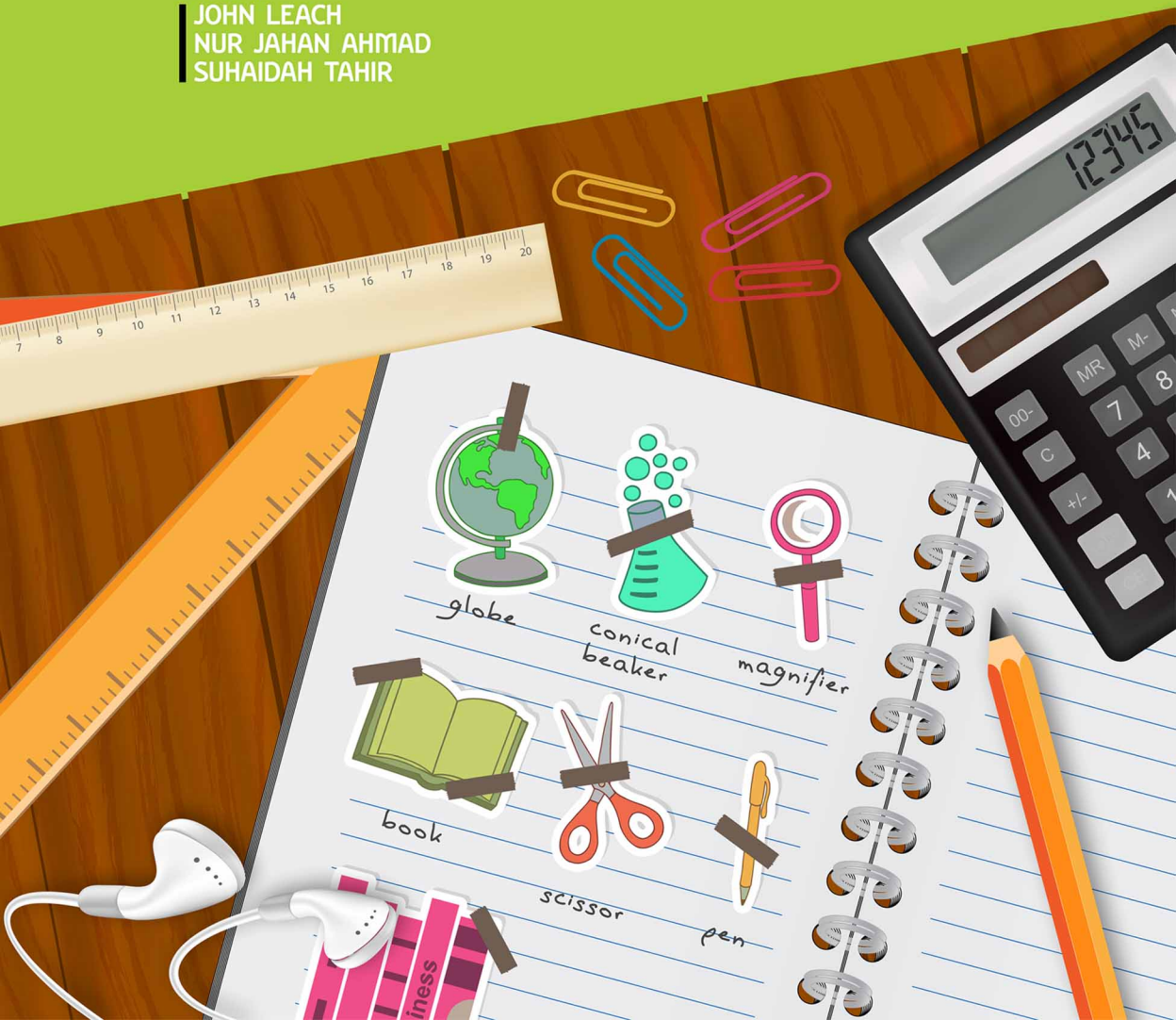


Southeast Asian Ministers of Education Organisation
Regional Centre for Education in Science and Mathematics

LEARNING SCIENCE & MATHEMATICS IN THE CLASSROOM: CASE STUDIES OF SUCCESSFUL PRACTICES

EDITORS

JOHN LEACH
NUR JAHAN AHMAD
SUHAIDAH TAHIR



**Learning Science and
Mathematics in the Classroom:
Case Studies of
Successful Practices**

Editors

**JOHN LEACH
NUR JAHAN AHMAD
SUHAIDAH TAHIR**

**Southeast Asian Ministers of Education Organisation
Regional Centre for Education in Science and Mathematics**

Copyright © 2014 SEAMEO RECSAM
**Learning Science and Mathematics in the Classroom:
Case Studies of Successful Practices**

For more information about this book contact:

The Director
SEAMEO RECSAM
Jalan Sultan Azlan Shah
11700 Gelugor
Pulau Pinang, Malaysia

Tel: +604-6522700
Fax: +604-6522737

Email: director@recsam.edu.my
URL: <http://www.recsam.edu.my>

Publication by:
SEAMEO RECSAM
Penang, Malaysia

All rights reserved, except for educational purposes with no commercial interests. No part of this publication may be reproduced, transmitted in any form or by any means, electronic or mechanical including photocopying, recorded or by any information storage or retrieval system, without prior permission from the Director, SEAMEO RECSAM.

ISBN: 978-967-930-037-6

Preface

This book is a compilation of articles by teacher-researchers which were developed following the *Fifth International Conference on Science and Mathematics Education (CoSMEd 5)* held in Penang in November 2013. The conference was hosted by the Southeast Asian Ministers of Education Organisation - Regional Centre for Education in Science and Mathematics (SEAMEO RECSAM). Established by the Southeast Asian Ministers of Education Organisation (SEAMEO) in May 1967, RECSAM is committed to nurturing and enhancing the quality of science and mathematics education in the SEAMEO Member Countries of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Leste and Vietnam.

RECSAM supports excellence in science and mathematics education across a wide range of countries. One vehicle for achieving this is bringing together expert teachers who have researched their own practice, and supporting them to develop their classroom studies for dissemination to other teachers through publication. The articles that appear in this book were carefully selected through a three-stage process of expert review and revision. The book presents 22 classroom studies organised into two sections addressing, respectively, science and mathematics education. The Conference had academic Tracks, and the studies represented in the chapters of this book represent a spectrum of the best work across the Tracks. The Conference Tracks were:

- Assessing Student Performance (School-based, Centralised, International)
- Internationalising the Curriculum (21st Century Skills, Sustainable Environment, World Peace, STEM Education)
- Transforming the Learning Environment (Inquiry-Based Science Education [IBSE])
- Developing Innovative Learners
- Using Technology as Enablers
- Enhancing Teacher Professional Learning Communities (Lesson Study, Peer Coaching)
- Engaging the Z-gen (Game-based learning, Social Network)
- Learning beyond the Classroom (Museum, Science Centre, Science Fairs, Field Trips, Involving the Public)

EDITORS

Professor Dr. John T. Leach (University of Sheffield Hallam,
United Kingdom)

Dr. Nur Jahan Ahmad (SEAMEO RECSAM)

Dr. Suhaidah Tahir (SEAMEO RECSAM)

EDITORIAL ADVISORY BOARD

SEAMEO RECSAM

Dr. Corrienna Abu Talib

Mr. Dominador D. Mangao

Dr. Hazura Ab Bakar

Dr. Kanageswari S. Shanmugan

Dr. Koay Suan See

Dr. Ng Khar Thoe

Dr. Thien Lei Mee

Malaysian Educator Reviewers

Ms. Boey Mei Li (Penang Free School)

Mr. Ch'ng Yeang Soon (Penang Free School)

Dr. Devadason Robert Peter (IPG Kampus Ipoh, Perak)

Ms. Linda Toh (Penang Free School)

Professor Dr. Munirah Ghazali (Universiti Sains Malaysia)

Associate Professor Dr. Nordin Razak (Universiti Sains Malaysia)

Dr. Norliza Kushairi (IPG Kampus Darul Aman, Kedah)

Dr. Shirley Tay Siew Wong (SMK Bandaraya Kota Kinabalu)

Professor Dr. Vincent Pang (Universiti Malaysia Sabah)

Professor Dr. Zurida Ismail (Universiti Sains Malaysia)

International Educator Reviewers

Mr. Allan M. Canonigo (University of Philippines)

Dr. Asma Almahrouqi (Ministry of Education Oman)

Dr. Euno Ryoichi (Japan, attached with Yayasan Pelajaran MARA Malaysia)

Ms. Gayatri Balakrishnan (Ministry of Education Singapore)

Associate Professor Dr. Lindsey Conner (University of Canterbury,
New Zealand)

Dr. Mohammed Alzaghibi (Ministry of Education Saudi Arabia)

Professor Mohan Cinnappan (University of South Australia)

Dr. Wahyudi (SEAMEO QITEP Indonesia)

Editorial Assistant

Ms. Ong Mei Yean

PUBLICATION

SEAMEO RECSAM

Ms. Wong Lai Cheng (Copy-edit)

Ms. Leong Yik Chin (Type-set)

Mr. Muhd Minsya Baharudin (Cover design)

Ms. Shaneem Kamarudin (Copy-edit)

CONTENT

Preface	iii
Panel of Reviewers	iv-v
Acknowledgements	ix
Section 1: Case Studies from Science Education	1
Chapter 1:	3
Effectiveness of '6N+2-V' Method in Drawing Octet and Expanded Octet Oxoanions Lewis Structures in Science Tutorial Classroom	
<i>Sathia Kumaran A/ L Krishnan</i>	
<i>Poh Seok Hong</i>	
<i>Noor Haslina Binti Ahmad</i>	
<i>Yvonne A/P Kulandaisamy</i>	
Chapter 2:	13
Learning Experiences on Global Learning and Observations to Benefit the Environment Workshop	
<i>Corrienna Abdul Talib</i>	
<i>Nur Jahan Ahmad</i>	
<i>Ng Khar Thoe</i>	
<i>Hazura Ab Bakar</i>	
Chapter 3:	21
Learning Pre-University Organic Chemistry Chemical Properties in A More Vibrant Way with ProMAP 1.0	
<i>Byron MC Michael Kadum</i>	
Chapter 4:	52
Balloon Molecule Models in Chemistry Classroom	
<i>Eng Guan Guch</i>	
Chapter 5:	61
Modelling Instruction™ Empowering Students in the 21 st Century Science Classroom	
<i>Kathy Malone</i>	
Chapter 6:	71
Using Card Game to Improve Learning in Chemistry Lesson	
<i>Lee Sze Yien</i>	
<i>Chin Chee Keong</i>	

Chapter 7: The Effect of Concept Mapping in Learning Physical Chemistry among Students of Perak Matriculation College <i>Lok Wai Foong</i>	78
Chapter 8: The Use of Collaborative Jigsaw Kit (CoJiK) in Developing Innovative Science Learners <i>Nabilah Abdullah</i> <i>Mohamad Hisyam Ismail</i> <i>Muhammad Furkan Mat Salleh</i>	89
Chapter 9: Musical Mnemonics to Facilitate the Learning of Matriculation Biology: Glycolysis <i>Miranda P. Yeoh</i>	97
Chapter 10: Problem-Based Learning Improves Students' Achievement in Chemistry on Topic Rates of Reaction <i>Sharifah Nor Ashikin Bt. S. A. Rahman</i>	107
Chapter 11: Beware of Lovely but Deadly Plants in Your Vicinities <i>Lee Shok Mee</i>	123
Chapter 12: A Study of Mangrove Ecosystem at Tanjung Emas Muar Using Project-Based Learning <i>Yazid Abdul Manap</i> <i>Kek Pei Pei</i>	140
Section 2: Case Studies from Mathematics Education	155
Chapter 13: Using Bansho Strategy to Improve Pupil's Ability in Writing Lesson Summary <i>Cheh Hui Yi</i> <i>Nurul Hidayah Lucy Abdullah</i>	157
Chapter 14: The Use of "Penta-BTOSS" Chart to Improve Year Five Pupils' Problem Solving Skills in Dealing with Mathematics Word Problems <i>Lee Kooi Peng</i> <i>Nurul Hidayah Lucy Binti Abdullah</i>	171

Chapter 15: Mudah 10 <i>Lim Soon Ee</i> <i>Tuan Haji Mohamed Akbar bin Nazardin</i>	195
Chapter 16: Using “Story and Music Mnemonic Instruction” to Teach Multiplication and Division Algorithm Process <i>Soh Ing Chian</i> <i>Rosmawati Binti Musa</i>	216
Chapter 17: The Use of Teleangularmeter in the Teaching and Learning of Mathematics <i>Chew Hock Hin</i>	234
Chapter 18: Preparing Secondary Pupils for Disaster Awareness through a Statistics Lesson <i>Tan Phei Ling</i> <i>Lim Chap Sam</i>	247
Chapter 19: Introducing Three-dimensional Coordinate Systems <i>Drew K. Ishii</i>	262
Chapter 20: Dynamic Learning of the Graph of Quadratic Function Improves Understanding <i>Khor Got Hun</i>	273
Chapter 21: Enhancing Higher Order Thinking Skills and Soft Skills through Project Work in Additional Mathematics <i>Ding Hong Eng</i>	284
Chapter 22: Practising Mathematics Outside of the Classroom <i>Tay Bee Lian</i>	298

Acknowledgements

This book was published under the auspices of SEAMEO RECSAM. The opinions expressed in these chapters are those of the authors and does not necessarily reflect the opinions of the Centre.

The editors wish to acknowledge and thank the following for their roles in making the publication of the book possible:

- The Centre Director, Dr. Hj. Mohd. Johan Zakaria for his leadership and motivation of the RECSAM Conference Committee in organising the 5th International Conference on Science and Mathematics Education (CoSMEd 2013) and in the publication of this book.
- The members of the International and national Panel of Reviewers listed earlier. We acknowledge the effort and expertise of the panel members who contribute to the raising of the quality of the chapters through their diligent and meticulous reviews.
- The authors of each chapter of this book.
- R&D staff.
- All staffs who are indirectly involved in this publication.
- The Publication Unit of RECSAM who have worked diligently to ensure the publication of this book.

