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Secondary Science Teaching for English Learners: Developing Supportive and Responsive Contexts for Sense-Making and Language Development

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Secondary Science Teaching for English Learners: Developing Supportive and Responsive Contexts for Sense-Making and Language Development describes the changing student landscape in the United States and the need to address the linguistic needs differences due to the changing demographics within the nation. The Secondary Science Teaching with English Language and Literacy Acquisition (SSTELLA) project aims to prepare the next generation of secondary science teachers and provide them with tools to support teaching science to English language learners (ELLs). The project aims to promote science learning, and secondly it seeks to facilitate literacy development in the sciences.

The book's primary target audience is new secondary science teachers, but it could also be relevant for experienced practicing teachers. SSTELLA practices align to meet current Next Generation Science Standards (NGSS; 2013) and Common Core State Standards (CCSS; 2017) curriculum objectives for secondary school science teachers while simultaneously addressing the needs of ELLs in school systems in the United States.

This ten-chapter book addresses the need for secondary school science teachers to make science lessons more contextualized. The three sections comprising the book are: *Foundations for Language, Literacy and Science Integration*; *Supportive and Responsive Science Teaching Practices*; and *Applying SSTELLA Practices to Curricular and*

Assessment Planning. The first part of the book places the need for an integrated approach to learning science and developing literacy for English language learners through the discipline of science. The next section introduces the SSTEMMA framework and provides details on the four main strategies that provide understanding of the context and their connection to CCSS and the NGSS. The final part of the book demonstrates the SSTEMMA framework with an actual science lesson.

Part One, *Foundations for Language, Literacy and Science Integration*, consists of two chapters which aim to make science education more relevant for the general population and applicable to the diverse learners in secondary school classrooms. Chapter One provides the reader with the context for understanding the changes in education as a result of current NGSS across the U.S. This chapter also helps the reader understand the need for learners to achieve content area literacy, which in turn fosters engagement with the discipline. The second chapter describes how teachers can build engagement in the classroom environment and defines how English language learners in the secondary content classroom can be more diverse than ELLs in the primary grades.

Part Two, *Supportive and Responsive Science Teaching Practices*, consists of five chapters that explain the SSTEMMA framework. This section also contextualizes science through scientific meaning making, scientific discourse practices, and literacy development within the discipline of science. Text boxes within the chapters include examples for the reader to analyze to help them interact with the material presented in each chapter. These text boxes are useful for identifying the contribution SSTEMMA makes to existing practices.

Part Three, *Applying SSTEMMA Practices to Curricular and Assessment Planning*, comprises three chapters which address using SSTEMMA practices in actual classrooms. Chapters Eight and Nine include a lesson about the antibiotic resistance of Methicillin-resistant *Staphylococcus aureus* (MRSA), which shows readers how teachers can engage students in the concept of natural selection and how species change over time. Chapter eight introduces the lesson, and chapter nine deconstructs it by explaining the reasoning behind the choices for the focus in the lesson.

The final chapter focuses on assessment practices using SSTEMMA, addressing how multiple-choice tests, commonly used in content area classrooms, actually put ELLs at a disadvantage due to unfamiliar vocabulary or cultural contexts in the questions (Kachchaf, Noble, Rosebery, O'Connor, Warren, & Wang, 2016). The chapter also includes a diagram presenting how learning objectives and small formative assessments can ultimately lead students to attain the big idea being presented through each of the smaller learning objectives.

The book presents activities and examples grounded in the current research for science education, as well as literacy education for ELLs. The included sample lesson using the SSTEMMA framework demonstrates SSTEMMA practices in action helping the reader to better understand the subtle differences SSTEMMA provides. The classroom discourse examples provided in the second section (chapters three to seven) help the reader see how SSTEMMA and non-SSTEMMA practices are similar but not the same when it comes to engaging students in the science classroom. Reading through the examples helps one

realize that SSTEMA is more than just engaging students in discussion, it is about providing a personal context for the science being explored and helping the student become more engaged in the scientific concepts being presented.

Aside from the partialities involved in the SSTEMA project, this book is an excellent resource for new science teachers entering the teaching profession. Current research practices support the methods described in the book for both science and literacy education for ELLs. The book is also useful for established teachers to reflect on their own teaching practices through helping them become aware of the literacy needs of their ELLs in the content classroom along with demonstrating SSTEMA practices. *Secondary Science Teaching for English Learners: Developing Supportive and Responsive Learning Contexts for Sense-making and Language Development* will provide practitioners with a useful tool to recognize and adjust to the importance of literacy instruction within the content areas and not just teaching the content material. Implementing the types of lessons and practices outlined in the book will also help ELLs transition to science content and may even provide them with the opportunity to pursue science, technology, engineering or mathematics (STEM) careers where they are highly under-represented.

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