

scientists. For instance, Elizabeth Pringle and Rodolfo Dirzo worked with her in Mexico to study the ant *Cordia alliodora* (p. 125). With Fred Adler, she examined path shape and information exchanged between ants (p. 69). Mark Brown worked with Gordon to examine foraging and colony interaction in a laboratory setting (p. 103). With Steve Pacala and Charles Godfrey, Gordon examined how foragers are successful and how they are able to encourage inactive ants to be more successful foragers (p. 60). This turned out to be accomplished using a chemical cue secreted from an abdominal gland. Alone, Gordon examined colony age and its relationship to the number of ants in the colony (p. 87). This is just one of many, many experiments Gordon conducted in her over 20 years in the field.

Gordon writes at a level that is approachable for both high school and college readers. She is an excellent inspiration to female students, especially to students contemplating going into field work. This book is also good to use as a resource for scientific papers as well as for general reading. There is a lot of information in the early chapters of the book that Gordon has synthesized from widespread sources. Overall, this is a wonderful resource for teachers and students alike.



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### SCIENCE EDUCATION: LEADERSHIP PRACTICES

*Science Education Leadership: Best Practices for the New Century*. Edited by Jack Rhoton. 2010. National Science Teachers Association Press (ISBN 9781936137008). 341 pages. Paperback. \$37.95.

Who are the science education leaders? What are the issues that science leaders need to address in this new century? What are the successful approaches to address these issues? These questions are addressed in this collection of 18 essays. The essay authors discuss not only how to bring success in science education but also how to develop the culture that supports continuous improvement in science education programs. Those individuals who are interested in improving science education will find many of the essays to be useful.

Most of the authors are university/college faculty in departments of science education

who have a broad viewpoint informed by research. Additionally, some of the authors are associated with professional organizations such as BSCS and AAAS. The section “About the Authors” is helpful in understanding the context from which the authors draw their perspectives.

There is strong agreement throughout the essays that the science teacher who is a teacher-leader within a school is the agent of change. The teacher-leader is described as a classroom teacher who is “open-minded, willing to pursue opportunities, and pursuing a commitment to lifelong learning.” These science teachers support fellow teachers, promote public understanding of science, and are advocates for students. These characteristics recur in the essays as they focus on recruiting, retaining, developing, and enhancing individuals who remain in the science classroom. There is much in this book about developing and nurturing these individuals.

The chapters are grouped into five themes. Each theme attempts to generate a focus for the chapters grouped within it. However, there is much overlapping among chapters and across themes. The first theme, “The Science Education Challenge: Redefining Science Education Leadership in 21st Century,” addresses the current structure and challenges in science education. Science education is portrayed as the pathway through which students learn how to transform and apply knowledge. These are identified as 21st-century skills. A description of how the National Science Education Standards can be used to prepare students for changing job-skills requirements is helpful.

“The Role of School and District Leadership for Building Instructional Capacity” is the second theme. These chapters can be powerful tools for teacher-leaders to inform administrators about the importance of continuing professional development for sustaining teacher-leaders. Universities are alerted that a revision of their course work is necessary since “research clearly indicates that most teachers do not possess an adequate understanding of inquiry and nature of science and lack skills and knowledge necessary to effectively teach either concept.” The Illinois Institute of Technology’s leadership program is described as an example of a successful curriculum that addresses these concerns.

The third theme, “School and District Science Leadership: Rationale, Strategy, and Impact,” provides approaches for improving the use of technology and inquiry in science classrooms at all levels, including college.

Within this theme, training and retention of teachers are viewed as a continuum with new roles for senior teachers. This is a wonderful idea, but the reality in many secondary schools will make this approach difficult.

For teachers and their administrators, the most powerful section in this book is the fourth theme, “School Improvement Processes and Practices: Professional Learning for Building Instructional Capacity.” Specific procedures for teacher discussion with strategies for improving science instruction and developing a supportive school environment are presented in a practical manner. Assessment is addressed through the question “How can students succeed without learning?” However, the use of two diagrams to illustrate how assessment is part of instruction made the process appear complex.

The final theme, “Leadership That Engages the Public in the Understanding of Science,” provides a look forward from the 19th century to the present as a context for strategies that enlist the public’s support for the continuing process of science education improvement. Reading this section placed the current concerns about the quality of science education into perspective: change is the constant in science education because of the social pressures of the times.

Although science education in general is the focus of this book, with no particular focus on life science, biology educators can find many of the programs and strategies helpful as they work to improve the learning of science in biology classrooms. The essays provide material for reflection by science educators at all levels. However, the readers who will find this book most useful need to have an interest in improving science education and bringing about change within their own environment.



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