

Book Review

Paul Webb, *Section Editor*

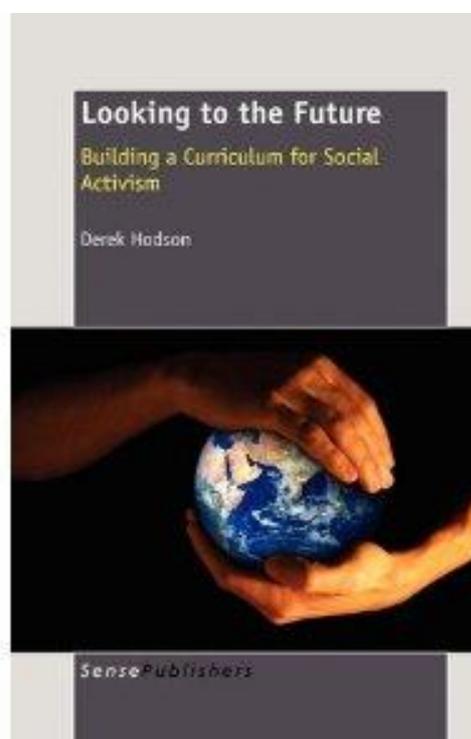
Looking to the Future: Building a Curriculum for Social Activism

by

Derek Hodson

*Sense Publishers: Rotterdam,
The Netherlands (2011)
406 pages, Paperback*

ISBN: 978-94-6091-470-6



“Looking to the future” has become not only a pervasive human endeavor, but also a resounding call and philosophical and strategic approach to address almost all of our contemporary and emerging problems and challenges, identify new opportunities, and develop new solutions across and in all fields, disciplines, ideologies, and frames of thoughts. Never before has there been such a collective conscious realization and recognition that the future matters here and now. Evidentiary toward such a prolific and consternating universal paradigm of 21st century society are the many global, international, regional, national, and local efforts by social, cultural, economic, legal, and political institutions in “building a curriculum for social activism.” This in essence, is a response to change and the need for change; planned change, and adaptation to unplanned change and uncertainty which Derek Hodson uses as the bedrocks of his book, *Looking to the Future: Building a Curriculum for Social Activism*.

Derek Hodson is Emeritus Professor of Science Education at the Ontario Institute for Studies in Education (University of Toronto). One can say that he bears this title extremely well, deservingly, and justly based on the scholarly-academic rigor, scope, intellectual fervor, richness in thoughts and ideas, and the philosophical adeptness of this book. While *Looking to the Future* focuses mainly on Science Education, the general reach of this book is admirably extensive, reflecting the breadth and depth of the author's education, knowledge, and experience concerning our current challenges and the need to re-engage and redesign curriculum to make Science Education more formidable and useful as competitive value and solution to our myriad problems. Professor Hodson will certainly find this volume of his one difficult to surpass in the diversity of topics and issues that characterize the extant literature of the field today.

Looking to the Future has ten (10) very informative chapters which the author supplements with extensive notes and an impressive array of top scholarly reference books and journals. The first chapter of the book, appropriately titled "Scientific Literacy Revisited" briefly traces the development of the term "scientific literacy" to more than 50 years ago, crediting Paul Hurd (1958) and Richard McCurdy (1958) for bringing the term into U.S. educational literature. Hodson describes scientific literacy as being "increasingly prominent in international debate about science education" (p. 1), and "a trend mirrored by a similarly expanding interest in technological literacy and environmental literacy" (p. 1). One of the most interesting concepts relevant to the subject and theme of this book mentioned in Chapter 1 is the "public understanding of science", which should become a major concern of science educators, policy makers, and our political and national leaders. The idea of the "public understanding of science" is more than ever, so common to our efforts to increase literacy in Science Education as well as technology and environment. The rationale for scientific literacy is also the subject of this chapter; that is, Hodson refers to this rationale in terms of the "why we need it and why we should promote [it]" (p. 2). This will always remain fundamental to questions on scientific literacy and Science Education for individuals, schools, and society. Hodson presents the rationale of scientific literacy categorized under three groups of arguments proposed by Thomas and Durant (1987): (i) perceived benefits of science, (ii) benefits to individuals, and (iii) benefits to society as a whole (Hodson, p.2). The chapter goes on to discuss the value of a scientifically literate population, scientific and technological literacy, the cultural, aesthetic, and moral-ethical benefits that scientific literacy confers on individuals, the benefits of scientific literacy to society as a whole and to democracy and responsible citizenship, the notion of multidisciplinary scientific literacy, sustainable development, environmental education, and rich themes that make this chapter not only the most diverse in content, but possibly the most interesting.

In Chapter 2, titled "Confronting Socioscientific Issues" (SSI), Hodson argues that, "the most effective way of learning to confront SSI, is by confronting SSI, provided there are appropriate levels of guidance and significance" (p. 33). The author expands this discussion by first presenting his 3-Phase Approach to confront SSI: modeling, guided practice, and application. Hodson questions the manner of acquisition of relevant scientific knowledge, and advocates a "Personalized Approach" which he describes as "attending to the particular needs, interests, experiences, aspirations and values of every learner, and to the affective and social dimensions of learning environments" (p. 35). The author goes on to discuss "*science-as-culture*" and the idea of "functional science" (p. 37) prelude to examining the nature of science in an extensive sectional essay ranging from analyses on the National Science Education Standards, discussion of traditional school curriculum, scientific reporting with regard to instruction and students' learning and knowledge in the field to the notion of "*evidentiary competence*" (p. 39) and its thirteen components as postulated by Jeong, Songer, and Lee. In this chapter Hodson also discusses the concepts of explicit approach and implicit approach as related to the nature of science (NOS),

students' understanding of the nature of technology (NOT), and practical knowledge for action based on the idea that, "knowledge requirements are not restricted to science and the nature of science or nature of technology" (p. 42). Language issues in science are also examined – the nature of science argument, and media literacy affecting science education and literacy and SSI; specifically, the role of information is discussed along with ideas of utility, control, risk, fate, and morality as related to this perpetuating theme. Another sectional essay in Chapter 2 examines the role of science education and scientific literacy in dealing with controversial issues from those intimate to the person of mankind to those dealing with our environment and broader planetary home. Finally, Hodson discusses the affective and social environments of learning as related to science education and the types of pupils that emerge from these environments to embrace science literacy.

"Building Curriculum" is the title of Chapter 3 in *Looking to the Future*. Here, Hodson reiterates the responsibility of science and technology education as that of "educating students about the complex but intimate relationships among the technological products we consume, the processes that produce them, and the biosphere that sustains us" (p. 71). The roles of thoughts, values, and aspirations in relation to the status quo of society and science education and literacy are discussed, and the author alludes to Noam Chomsky's (1969, 1991) idea of "manufactured consent" and Gerard Fourez's (1982) "Liberation ethics" (p. 72/p. 73). Using these and other fundamental concepts that underscore solid discussion of science's struggle against social and political norms to assert a more dominant place in individual and societal worldview, Hodson also presents a disconcerting duplicity of interest that affects the passage of science education. On one hand he argues are "those who seek to maintain science education's current preoccupation with abstract, theoretical knowledge and with pre-professional preparation courses" and those "who regard the reformulation of science education in terms of more overtly political goals as undesirable" (p. 74). Hodson proposes a new curriculum for science education which he describes as one which "aims to encourage and support students to ask awkward questions, formulate an alternative view of what is desirable, and work towards changing the status quo, both within and between societies" (p. 75). The author further discusses democracy and citizenship education and then explores the viability of building a coherent curriculum, and how the ideals of priorities, interests, values and social justice impact this effort. Several key issues that are common to societies are presented in relation to the proposed need for renewed science education: human health; land, water and mineral resources; food and agriculture; energy resources; industry; IT and transportation; and ethics (p. 90). Hodson emphasizes the role of science education and literacy in equipping us for action and applies his 3-Phase Approach of modeling, guided practice, and application instrumental in this action.

There is no doubt that science needs much more attention, especially as our world changes in processes that build and break what many of us see on the surface as a stable world. Thus, Chapter 4 of *Looking to the Future*, "Turning the Spotlight on Science" is appropriately titled to reflect this need to focus on science and improving scientific education and literacy. "Science is a creative, collaborative and culturally embedded activity..." declares Hodson, and he examines this through what he calls "The Constitutive Values of Science". In this discussion four perspectives stand out as paramount concepts in our understanding: universalism, commonality, disinterestedness, and organized skepticism. Hodson also discusses what he calls the "counter-norm" (p. 112) to each perspective. Hodson discusses how a "*personal framework of understanding*" or "contextual values" (p. 115) affect individual scientific views and science as a social activity involving investigations. The author discusses the idea of worldview relative to "worldview theory" and presents us with Kearney's (1984) seven major components of a worldview. Bias and distortion in science are discussed with regard to issues of gender, technolo-

gy, ignorance (p. 121), and the concept of “*Scientific racism*” (p. 124) is briefly explored. Finally, closing this chapter, Hodson discusses contemporary scientific practice and the changing nature of science and efforts to change science.

Chapter 5 of *Looking to the Future* is a continuation of discussions from Chapter 4, but focusing more strongly on science education, and thus titled, “Turning the Spotlight on Science Education”. Hodson believes that the values that impregnate science education should be seen as essential in the affirmation of the need for scientific knowledge and literacy in our society, and that such values should be projected through schools’ science curriculum. The curriculum is explored as containing values derived from three major sources: (i) science values, (ii) education values, and (iii) values of the surrounding society (p. 137). According to Hodson four important questions must be answered in developing curriculum for science education: (i) *What* values are included? (ii) *Whose* values are included? (iii) *Whose* values are *excluded*? and (iv) What is made *explicit* and what remains *implicit*? (pp. 137-138). Hodson goes on to discuss what he terms “The Consumerist Agenda” by discussing the role of science in promoting economic growth and technological development as a motive of much science education drivers and presents Bencze’s (2001) concepts of compartmentalization, standardization, intensification, idealization, regulation, saturation, and isolation in impacting the teaching or planned curriculum for science or acquisition and application of scientific knowledge or literacy. Finally, Hodson ends this chapter by surveying the need to examine the perspectives and prospects of science education in our contemporary global economic society and the need to redirect technology in ways that benefit the goals of scientific literacy.

No discussion of science education can be complete without concerns for responsibility and outcomes. Chapter 6 of *Looking to the Future*, “Strategies, Responsibilities and Outcomes” discusses several approaches to teaching science, identifies several resources to enhance scientific knowledge and understanding, and focuses cheerily on the roles of multimedia and Internet-based activities in developing a curriculum to focus on SSI. Three important strategies in science education to which Hodson devotes much attention in the chapter are discussion, debate, and group work. In presenting these three important strategies, Hodson alludes to types of student talk in the science classroom or science education (p. 168): exploratory and presentational talk (Barnes, 1988), and disputational, cumulative, and exploratory talks (Mercer, 1995, 2000). Hodson revisits the affective and social environments of learning, presents several research findings related to evidence that “SSI-oriented teaching promotes conceptual understanding” (p. 176), explores multiple perspectives on these issues and examines the concepts of trust, values, ethics, emotions, and intuition as they affect responsibility and outcomes in science education. Finally, Chapter 6 examines the problems, difficulties and anxieties that teachers face in planning science curriculum and education.

Albert Einstein once remarked, “Science without religion is lame, religion without science is blind” during the 1941 Symposium on Science, Philosophy and Religion. Well, in the same light, science without ethics is unbalanced and dangerous. Hodson, as a superior educator of science educators understands this, and thus Chapter 7 of *Looking to the Future* is titled “Teaching Ethics”. In this chapter, Hodson discusses several problems and issues of science relative to ideas of right and what we ought to do as embodied in differing ethical perspectives. Human health issues and rights emerge as prominent in Hodson’s discussion, from ADHD, DNA-genetics and stem cell issues and definition of what constitutes human life, to ethics in science regarding non-human subjects. Several ethical theories with implications for scientific modeling, guided practice, and application are presented: social construct (contract) theory, consequentialists-utilitarian theory, deontological ethics, virtue ethics, and the meaning of right

and unacceptable as used in science research and education. Hodson discusses the rationale for teaching ethics and closes the chapter by exploring the use of case studies in science education.

Globally, we are confronted with a series of unprecedented environmental issues which we are scurrying to address and attempt to resolve. “Confronting Environmental Issues” – Chapter 8 of *Looking to the Future*, addresses what could be termed a widespread case of “citizen ignorance” regarding science literacy and education. Hodson believes that citizens remain “blissfully unaware of the extent of the problems” (p. 223) that concern environmental scientists and activists, and he cites a number of barriers including the ways we live and failure to accept science and technology as part of this problem. In discussing the need for education about the environment Hodson mentions the Ausubelian principle of teachers starting with students’ existing knowledge and expanding into scientifically determined rationale. He further discusses the roles that fear and denial play in affecting scientific literacy education and learning and looks at education for the environment from the perspective of Argyeman’s (2002) “*pro-environmental behavior*”. Ideas of the moralistic and democratic approaches to environmental education are explored and the environment is explored as a “social contract” (p. 238). Closing out the chapter, Hodson demonstrates how we are changing our environment both positively and negative through our education for environment, and about environment.

Chapter 9, “Place, Community and Collective Action” pools together a variety of environmental and scientifically bounded issues that are critical in rethinking and redesigning science education and curriculum. Hodson discusses the importance of “broadening students’ conception of the environment” (p. 267) in addressing this new call for building a curriculum for social activism, and not just activism, but real application as proposed in his 3-Phase Approach. Hodson believes that an essential part of science education is helping students to develop a “sense of self” which he defines as “focusing on the immediate community in which students live, seeking out local resources, focusing on local issues and helping students learn how to ask and answer questions about the phenomena and events that surround them” (p. 271-272). Thus, place becomes a critical pedagogical factor in science education according to Hodson’s perspective. The chapter closes with an extensive discussion of students’ preparation for activism and the need for political literacy in shaping them for this role.

The final chapter of *Looking to the Future*, Chapter 10, “Making It Happen” represents Hodson’s last call as a writer, philosopher of science education, activist and educator in the field for all stakeholders and especially community leaders and educators to build strong science education curriculums that engender the principles of modeling, guided practice, application and activism through the new paradigms proposed to revisit and reconstruct scientific literacy and education. There is no doubt that Hodson has already convinced his readers from the very first chapter of this book of the need for strong science education at both individual and national levels. Teachers of science must strive to be “transformative intellectuals” (p. 302) to make the needed change and we must now heed the call with the same strong passion and fervor that Hodson puts into writing this volume.

This book is one of those few that should become part of every university and college reference library and will serve equally as a reference and teaching resource in science education and literacy, and a textbook for the subject in higher education. It is most suitable for those engaged in higher education studies in science education and science literacy because it has significant contents, concepts, and depth that require a broad command of language and thought. This is indeed an excellent contribution by Derek Hodson, a true emeritus scholar of science education.

Reference

Hodson, D. (2011). *Looking to the future: Building a curriculum for social activism*. Rotterdam, The Netherlands: Sense Publishers.

Donovan A. McFarlane

*Chief Academic Officer and Director
The Donovan Society LLC, USA
Fort Lauderdale, Florida 33311
United States of America
Email: don_anthoni@yahoo.com
Web: www.thedonovansociety.org*