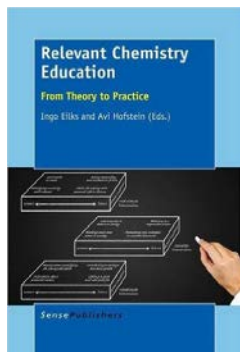


## Books review

EILKS, I. & HOFSTEIN, A. (eds.). *Relevant Chemistry Education – From Theory to Practice*. Rotterdam/Boston/Taipei: Sense Publishers, 2015, 396 pp.



### INTRODUCTION

“For every 100 pupils coming into a school, perhaps only 1% goes on to a degree in chemistry, with, perhaps, another 2% taking a degree heavily dependent on chemistry” (REID, 2000, p. 383)

From time to time, people who are strongly involved in chemistry education will ask themselves questions about the relevance of their professional activities. For example, why is it important to teach chemistry? What meaningful chemistry content should be taught? For whom should this content be of interest? These questions highlight core issues in chemistry education: *why and what to teach to whom?* The responses to these central questions not only vary for different

levels of formal education (university, college, school) but they have also varied for different chemistry education reform projects over the past fifty years. Finally, they vary among different stakeholders in chemistry education. For instance, the goals of policy makers are not always aligned with those of educators, and what these two groups value is often different from what students judge relevant to them.

Many articles have been written about the relevance of chemistry education. They are all dispersed in a wide range of journals, reports and other documents. For that reason, it is not easy to get a quick and coherent overview of the theme. Fortunately, a book has been recently published on this particular topic comprising 20 chapters written by 42 renowned authors from 16 countries. (EILKS & HOFSTEIN, 2015). This publication aims to reflect the current state of the ongoing debate on the value of chemistry education and is concisely reviewed below.

### THREE DIMENSIONS OF RELEVANCE

The analysis of the relevance of chemistry education is tightly linked to the discussion of the general relevance of formal education. For that reason, it makes sense to firstly look at the meaning of the latter. The relevance of formal education is often discussed along three major dimensions related to specific educational goals. The first goal was formulated by the famous German scholar Wilhelm von Humboldt (1767-1835) and is usually called the goal of personal growth (*‘Bildung’*). This goal corresponds to the individual dimension of relevance. The second and third goals were expressed by the influential French sociologist Emile Durkheim (1858-1917) and are often called the goals of socialization and qualification. These goals correspond to the societal dimension and the vocational dimension of relevance. The elaboration of these three dimensions of relevance in chemistry education is the backbone of the book under review.

The chapters in the book are clustered in four sections. An overview of the book’s organization is presented in Table 1. This structure of sections is very clear and facilitates the reading for people who would like to quickly develop an understanding of critical aspects of relevant chemistry education. The book’s structure should also help readers who would prefer to quickly scan this resource in search of issues of their personal interest.

**Table 1**  
Cluster structure of the book under review

Section on relevance	
Number of chapters	
• Individual dimension	7
• Societal dimension	5
• Vocational dimension	4
• Non-formal/informal education, teacher preparation	3

### ELABORATION OF THE DIMENSIONS

The *section on the individual dimension* addresses the value for students of a) experiencing the richness and excitement of knowing about and understanding the natural world, and b) using appropriate chemical processes and perspectives in making personal decisions (cf. NRC, 1996). These notions are elaborated in

several ways. One chapter explores the question of why it is relevant to learn the big ideas in chemistry at school. Answers to this question show that, in general, chemistry educators judge conceptual big ideas of and about chemistry as more relevant than contextual big ideas of chemistry, while students are more interested in contextual issues that affect them personally. Two other chapters present a number of chemistry curriculum topics as case studies for students for improving their chemical literacy. This approach demonstrates how the chemistry taught in schools can equip students to meet the challenge of an increasingly complex and chemistry-dependent world. There are also chapters on learning chemistry in an academic context, the role of values in chemistry education, and ways of promoting metacognitive skills and argumentation skills in the context of chemistry stories.

The *section on the societal dimension* addresses the value for students of engaging intelligently in public discourse and debating about matters of chemical and technological concern (cf. NRC, 1996). One chapter discusses the idea of filtered information and the learning about the use of chemistry-related information in the public. Another chapter deals with the issue of STS as a feasible paradigm for the relevance of chemistry education in emerging countries. There is also a chapter describing the relevance of chemistry for sustainability and presenting examples from the chemistry classroom, such as chemistry learning embedded in socio-chemistry issues. Other chapters discuss the fruitful use of mass media in teaching chemistry, and the differences between boys and girls regarding their opinion of relevant chemistry education.

The *section on the vocational dimension* addresses the value for students of increasing their economic productivity through the use of knowledge, understanding, and skills of the chemically literate person in their careers (cf. NRC, 1996). One chapter discusses the meaning of learning from and about cases related to industrial chemistry and related businesses. Another chapter focuses on the value of cooperative and work-integrated education in chemistry career clarification. There are also chapters on fostering the implementation of green chemistry ideas, and fostering chemistry students’ innovation competence and employability.

The *final section* elaborates the relevance of chemistry education in the context of non-formal and informal education, and teacher preparation.

### COMMENTS

The concept of relevance can be thought of as a ‘container’ concept that carries a large variety of meanings. In consequence, the expression ‘relevance of chemistry education’ also has quite a broad range of connotations. It is the merit of this book that it offers a very clear picture of relevant chemistry education through its focus on three major dimensions: individual, societal, and vocational.

The introduction of these individual dimensions may suggest that they should be considered as separate aspects of relevance in chemistry education. However, highlighting them in different clusters of chapters only serves an analytical function for clarifying the concept of relevance. In several chapters, the discussion about a particular leading dimension is related to one or two of the other dimensions, either explicitly or implicitly. In other words, the three dimensions are not isolated but only distinguished.

In conclusion, this well-structured book is a very rich and up-to-date resource of evidence-based information, opinions, and suggestions for improving chemistry education through making it more meaningful to students. This resource should be of interest to a wide range of professionals in chemistry education: policy makers, curriculum developers, teacher educators, educational researchers, and, last but not least, preservice and inservice teachers. This is certainly a very “relevant” book!

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