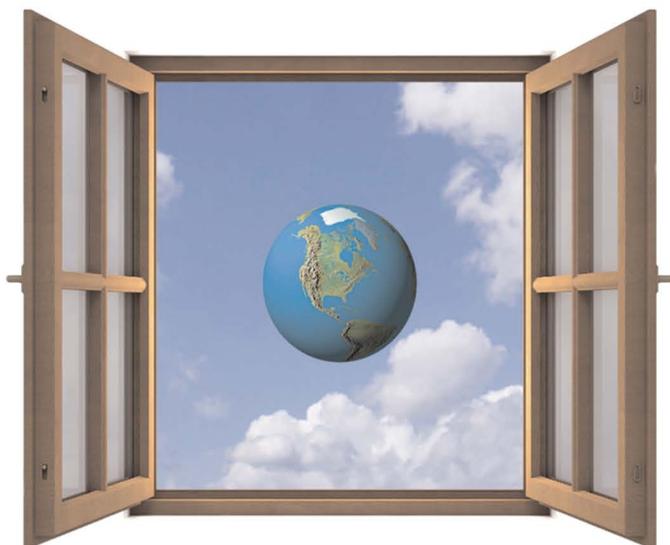


# OPENING UP EDUCATION

---

The Collective Advancement  
of Education through Open Technology,  
Open Content, and Open Knowledge



edited by

Toru Iiyoshi and M.S. Vijay Kumar

foreword by John Seely Brown

---

# Opening Up Education



---

# Opening Up Education

The Collective Advancement of Education through  
Open Technology, Open Content, and Open  
Knowledge

Edited by

Toru Iiyoshi and M. S. Vijay Kumar

Foreword by John Seely Brown

The Carnegie Foundation for the Advancement of  
Teaching

The MIT Press  
Cambridge, Massachusetts  
London, England



## Attribution-Noncommercial-No Derivative Works 3.0 United States

You are free:



**to Share** — to copy, distribute, display, and perform the work

Under the following conditions:



**Attribution.** You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).



**Noncommercial.** You may not use this work for commercial purposes.



**No Derivative Works.** You may not alter, transform, or build upon this work.

- ◆ For any reuse or distribution, you must make clear to others the license terms of this work. The best way to do this is with a link to this web page.
- ◆ Any of the above conditions can be waived if you get permission from the copyright holder.
- ◆ Nothing in this license impairs or restricts the author's moral rights.

Disclaimer

**Your fair use and other rights are in no way affected by the above.**  
This is a human-readable summary of the [Legal Code](#) (the full license).

© 2008 Massachusetts Institute of Technology

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

This Creative Commons Edition is available through the generous support of the Carnegie Foundation for the Advancement of Teaching.

For information about special quantity discounts, please email [special\\_sales@mitpress.mit.edu](mailto:special_sales@mitpress.mit.edu)

This book was set in Sabon by SNP Best-set Typesetter Ltd., Hong Kong.

Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Opening up education : the collective advancement of education through open technology, open content, and open knowledge / edited by Toru Iiyoshi and M. S. Vijay Kumar.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-262-03371-8 (hardcover : alk. paper)

1. Distance education—Computer-assisted instruction. 2. Education, Higher—Effect of technological innovations on. 3. Educational technology. 4. Open learning. I. Iiyoshi, Toru. II. Kumar, M. S. Vijay.

LC5800.O678 2008

378.1'758—dc22

2007039375

10 9 8 7 6 5 4 3 2 1

*To our wives and sons—  
Hiromi, Rukmini, Ken, Suhas, and Taku  
—whose support and encouragement makes this important work  
possible.*



---

# Introduction

Toru Iiyoshi and M. S. Vijay Kumar

*It's almost as if a window was opened through which the future was very clearly visible. "See that?" he said. "That's the future in which you are going to live your life."*

—Albert A. Gore, *An Inconvenient Truth* (2006)

Al Gore first realized what the future might look like when one of his undergraduate professors showed him how human activity—unless changed—would lead to the acceleration of global warming, resulting in serious harm to the environment and all life on earth. Alerted and intrigued, but most importantly motivated, Gore began working to change the future. The window was opened to him as a young man, and together with people around the world, he began to take action, both individually and collectively, to bring about a preferred future.

Similarly, our motivation for embarking on this book has been to open a window for our readers into the future of education. We hope that as you read through its chapters and see visions of what is possible, you will be alerted, intrigued, and motivated to start taking steps, in your own capacity, towards a preferred future for education.

## A Perfect Storm

Before we jump into that future, though, let us quickly look back and remind ourselves that education's history is one of expansion and innovation. As the number of people participating in education has increased, so has the number of ways in which we learn and teach. In other words, the history of education is a narrative on *opening up education*. Over the last few decades, new media and information communication

technologies have enabled faculty, students, and educational institutions to advance education in many ways. Computer-Assisted Learning, Intelligent Tutoring Systems, Computer-Supported Collaborative Learning, interactive multimedia, telecommunications, and the Internet have not only transformed how we learn and teach but have also extended educational opportunity.

Today, a confluence of events is creating the perfect storm for significantly advancing education. With a growing inventory of openly available educational tools and resources, and with an increasingly engaged and connected community, transformative opportunities for education abound. We see a proliferation of new initiatives, many with the potential to radically change the ecology and the economics of education. However, to date, many innovative educational endeavors still remain in isolated and closed domains, rarely shared across classrooms, disciplines, or institutions. Thus, educators find it difficult to advance their pedagogical practice and knowledge as a community.

The good news is that the emerging open education movement in higher education and beyond is beginning to change the way educators use, share, and improve educational resources and knowledge by making them open and freely available.

We are cognizant that the term “open education” can have multiple interpretations and the movement has multiple dimensions.

Rather than propose one more definition, our reference to open education embraces the many dimensions of this movement as well the many interpretations of the term “open” as it has been applied to education over time, such as increased access, greater choice, and flexibility. What we offer instead is an extension to these definitions that emphasizes the value of collectivity leading to an assertion (more in the nature of an aspiration) that a key tenet of open education is that *education can be improved by making educational assets visible and accessible and by harnessing the collective wisdom of a community of practice and reflection.*

There are several indicators of how the open education movement is affecting the educational landscape. For example, tens of thousands of course Web sites and other educational materials are now freely available from hundreds of institutions, organizations, and projects from thousands of educators around the world, representing an unprecedented

upsurge in access to educational resources. At the same time, hundreds of educational institutions have joined international consortia and alliances to develop and share open educational technologies, resources, and repositories, creating new models of collaboration for the production and distribution of educational resources. Furthermore, some of these groups are moving toward the collaborative construction, extension, and revision of course materials across disciplines, indicating that “building upon each other’s work,” which has been a valued common practice in research over centuries, finally starts gaining momentum in teaching and learning.

Perhaps the most significant sign of open education’s promise of deep transformation is that it is becoming an essential part of the discourse on educational opportunity and change at institutional, national, and international levels. Forums sponsored by OECD (See *Giving Knowledge for Free: The Emergence of Open Educational Resources* at <http://www.oecd.org/cer>) and UNESCO (See <http://www.unesco.org/iiep/virtualuniversity/forums.php>), and conferences hosted by developing countries, actively explore the effectiveness and viability of open solutions to address large-scale educational reform. Teacher training and faculty development efforts are areas of particular interest, along with opportunities for continuous education. Meanwhile, institutions in developed countries are beginning to grapple with how the open education movement can bring vitality and relevance to curricula through new models of learner participation, and through cross-disciplinary and global perspectives. These institutions are also beginning to rethink their educational infrastructure in order to better support open education.

Yet, despite the increasing interest in open education and the availability of these growing collections of educational tools and resources, we risk missing the transformative and innovative opportunities, be it for improving teaching and learning in a single classroom or creating the necessary educational capacity for nation building. As a global educational community, we can benefit from a deeper understanding of how open educational tools and resources are being created and used in ways that build upon one another’s experience and practical knowledge. It is vital that we continue to explore possible synergies and sustainability strategies for all these current and

future open education efforts and promote a “culture of openness” across boundaries and borders.

We believe that the timing is right for the engagement exercise called for in this book. The movement has advanced far enough for us to articulate the visions and conditions necessary for opening up education in ways that can dramatically advance learning and teaching. It is our hope that the experience and wisdom captured in this volume will help to make such visions and conditions tangible and move us forward.

### **Building This Collection**

As a collection of 30 reflective and generative essays by 38 prominent leaders and thinkers involved in open education initiatives, this volume explores the *challenges* to be addressed, the *opportunities* to be seized, and the potential *synergies* to be realized from the various efforts in the movement for enhancing educational quality and access. The authors are faculty, researchers, academic technology experts, directors of major open education projects, administrators, leaders of professional organizations, and program officers and scholars from granting and research foundations, so, as you can imagine, the perspectives, ideas, and visions they provide are broad, diverse, and, of course, thought provoking.

From the inception of this project, our goal was to engage the authors in a collective exercise of critical reflection on the open education movement. With the aforementioned key tenet of open education as a foundation, we presented our authors with a framing question: “How can we take full advantage of open educational technology, content, and knowledge to create opportunities to improve the quality of education?” Finally, in order to establish coherence within and across the sections of this volume, we urged our authors to consider the following dimensions in addressing the framing question:

- The educational value proposition and implications of open education initiatives;
- The micro and macro factors that would accelerate these initiatives towards having a larger impact on education; and

- The means and mechanisms for iteratively and continuously improving the quality of teaching and learning through effective development and sharing of educational innovations and pedagogical knowledge.

We also used several elaborated questions for each of these statements to help the authors better reflect on and respond to these issues ([Appendix A](#)).

In September 2006, the authors and the editorial team convened the Open Education Summit at The Carnegie Foundation for the Advancement of Teaching in Stanford, California, to launch the book project. The summit brought together many of the book's contributors to collectively explore and articulate their visions for open education and the issues they saw emerging in this rapidly growing area. The intent was not only to bootstrap the publication project but also to identify future research and development agendas. Questions emerged relating to understanding and promoting the impact of open education efforts.

- How can we enable and encourage learners and educators to participate in open education?
- What does open education mean as an agency for both formal and informal education?
- How can niche learning communities take advantage of open education?
- What support needs to be provided?
- What are the different types of warranting mechanisms underlying the different types of certification we currently have?

In addition, many possible indicators of transformation, significant risk and challenges, and synergy were suggested from multiple perspectives during the Summit ([Appendix B](#)).

## **The Organization of This Book**

Even though many of our authors have been closely associated with various significant open education initiatives, this volume is neither a collection of reports on open education projects nor up-to-date summaries of their successes. Instead, the authors have shared their critical analyses and reflections on the strategic underpinnings of past and current

open education efforts, exploring issues and possibilities, and building upon their own and others' experiences. They have delved into the implications and visions for future work in three areas: open educational technology, content, and knowledge of practice.

We took this three-section organization (technology, content, and knowledge) largely as a convenient and easily understood framework. Naturally, the three categories are not mutually exclusive. In fact, their natural interrelationships become evident from the very beginning, and as you read through these chapters you will find that many of them discuss possibilities and challenges across these dimensions, exploring critical implications and synergies not just for one area but also for the entire realm of open education.

Each section opens with a section editor's introduction that includes: a brief definition(s) of the area and the scope of the section; major issues and topics in the area; a sample of the main ideas and viewpoints presented in the chapters of that section, and some perspectives from the section editors, along with some navigational guidance. A set of chapters then addresses the multiple dimensions of the impact that various open education efforts have had and could have on the form and function of education. Finally, each section ends with a chapter contributed by leaders from a funding or research foundation that has devoted significant effort toward advancing open education.

Throughout this volume, perspectives are offered on how "lessons learned" from these ambitious open education efforts can achieve a collective vision, characterized by an abundance of sustainable and transformative educational opportunities and not merely pervasive use of technology-enabled tools and resources.

The book implicitly celebrates the success of the initiatives that have helped invigorate the open education movement. But it is also an invitation to explore areas of discomfort as we reflect on the limited impact so far and the potential for remarkable change.

Our intent, finally, is to issue a wake-up call to the education community to not miss the boat and under-explore the potential for reinventing and energizing education. Otherwise, the open education movement will be ephemeral and will not make substantial impact on learning and teaching. Accordingly, we close the volume with a chapter in which we

share some concrete recommendations for shaping the collective agenda for open education's future.

### What Readers Should Look For

We anticipate that the readers of this book—as educators committed to innovation and change, students interested in how technologies can help bridge living and learning, and leaders interested in shared resources, planning, and policy making—will be concerned with the future of education.

For us as editors, assembling this volume and working closely with the section editors and authors has been a tremendous adventure and rewarding journey. We invite you, the readers, to join and extend this excursion as you make your way through the book, taking your individual paths and making stops along the way depending on where you want to go and what you might be seeking. We encourage you to cross the borders of the book's sections on technology, content, and knowledge.

As you navigate your way through this collection we urge you to consider the role of open education in helping to explore solutions to the critical challenges that we all face everyday as learners, practitioners, educational researchers and planners. And we invite you to grapple with questions such as these: How can we make teaching and learning more stimulating and engaging? How can we make good teaching and learning practices visible and shareable? How can we harness educators' inspiration and passion for better teaching and learning?

We hope your intellectual journey through this book is an engaging, productive, and rewarding experience that will assist you as you join others to construct an ideal future for education.

Bon Voyage!

### Reference

David, L., Bender, L., Burns, S. Z. (Producers), and Guggenheim, D. (Director). (2006). *An Inconvenient Truth* [Motion Picture]. Based on the book *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It* by Al Gore. United States: Paramount Classics and Participant Productions.

### Appendix A. The Questions Used to Promote Authors' Reflections

<p>Approaches to Share Effectively, as a Community of Practice and Reflection, the Innovations and Pedagogical Experience and Knowledge to Improve the Quality of Teaching and Learning in Various Contexts and at Many Levels</p>	<p>The Micro and Macro Factors That Will Move These Initiatives from Their Current Stage to Whatever Their "Golden" State Might be</p>	<p>Approaches to Share Effectively, as a Community of Practice and Reflection, the Innovations and Pedagogical Experience and Knowledge to Improve the Quality of Teaching and Learning in Various Contexts and at Many Levels</p>
<p>The Educational Value Proposition and Implications of Open Education Initiatives</p>	<p>If there was only one thing you could change about ways your initiative is organized, what would it be?</p> <p>Given your initiative's current standing and your goals, what more will it take to achieve them?</p>	<p>What kind of community do we need in order to build, leverage, and take advantage of open education and for what purposes?</p> <p>How can we encourage and support effective adoption and adaptation of open educational tools and resources to promote local pedagogical innovations?</p>
<p>In Your Field . . .</p> <p>What are the unique value propositions of your initiative(s)?</p> <p>What are the educational or other motivations behind your initiative(s)?</p>	<p>What are the unique value propositions of your initiative(s)?</p> <p>What are the educational or other motivations behind your initiative(s)?</p>	<p>What are the unique value propositions of your initiative(s)?</p> <p>What are the educational or other motivations behind your initiative(s)?</p>

<p>What are your critical and candid reflections on what you and others have done in the field so far (in terms of successes, obstacles, problems, and impact)?</p>	<p>Given their “open” nature, what do you see as key risks to the quality of open educational tools and resources? And, what are effective mechanisms to ensure their quality?</p> <p>How can we take advantage of open tools, resources, and knowledge to transform and improve teaching, learning, and educational systems?</p>
<p>Thinking broadly . . .</p> <p>What is the potential for open education to change educational outcomes? Why?</p> <p>What are constructive ways of evaluating the effectiveness of open educational assets in teaching and learning?</p>	<p>How can we make open education sustainable?</p> <p>How can we make open education scalable?</p> <p>Why is interoperability and standardization of format critical? What are major challenges?</p> <p>What have you learned from others’ successes and challenges (within your field and across fields)?</p> <p>How could these fields and initiatives collaborate and intersect to achieve greater goals?</p>

## **Appendix B: Select Indicators of Transformation, Significant Risk and Challenges, and Synergy from the Open Education Summit**

### 1. Indicators of Transformation

- Virtual “meta” universities created which offers access to cross-linked educational resources.
- Curriculum approval processes include criteria about re-use/adaptation of the most appropriate resources and expertise from other teachers and learners
- Students keep the record of their own learning that has been validated in a variety of ways by a variety of educators.
- Greatly expanded and accepted pathways to learning anything and everything
- 100% of students finish college who enter college.
- Contribution to research on teaching of their subject is necessary criterion for promotion to full professor in top universities.

### 2. Indicators of Significant Risk/Challenges

- Lack of meaningful methods of assessing and validating what someone has learned.
- Failure to integrate open education initiatives into other institutional approaches to enhance faculty development.
- Reluctance to participate in open education because of financial, sustainability, and preservation concerns.
- Less coherence in many individuals’ education through decreased guidance, feedback, structure, warranting of choices.
- The cultural communities that surround causes are fractured and not replaced leaves a growing anomaly associated with participation in the learning process.

### 3. Indicators of Synergy

- Partnering across institutions or systems to offer subscription based education.
- Wider and more economical access to textbooks and other educational materials.
- More flexible means of pursuing teaching and learning goals.
- Productivity of educational organizations increases while redundant work is reduced and energy shifted to more creative work with learning and teaching.
- Funding for teaching innovation is dependent upon re-use of existing teaching innovations as in the research domain.