The essays in this edited collection reflect on the nature of open education resources, where the question on openness for education emerges. What is remarkable today are the ways that teachers and institutions now begin to form part of the processes of global exchange and production of a network of global educational commons. The question about the significance of this development, their limits and the consequences for practitioners and institutions from the perspective of teachers is extremely complex. For example, the policy agenda of institutions, states, and international organizations related to the regulation of new technologies facilitates the existence and viability of those resources. This has consequences for the ways that those resources are used and produced by educators. Contributors to this collection, each on their own way, argue that Open Education involves a commitment to openness and is therefore inevitably a political and social project. This book ends with a challenge for those engaged in exploring the potential impacts and possibilities of open education initiatives. The open education paradigm and its consequences for educators and learners speak of an uneven geography where the access to technological infrastructure does not necessarily imply freedom or openness. In those instances, openness in education related to open education initiatives requires an engagement in research about the ways in which policy, cultural, digital and educational environments facilitate a political commitment to open systems of knowledge production and distribution. One thing is sure, as the essays in this book demonstrated so clearly, these developments promise an implicit paradigm of openness and democratic collaboration in education that remains to be realized.
Open Education and Education for Openness
Scope
This series maps the emergent field of educational futures. It will commission books on the futures of education in relation to the question of globalisation and knowledge economy. It seeks authors who can demonstrate their understanding of discourses of the knowledge and learning economies. It aspires to build a consistent approach to educational futures in terms of traditional methods, including scenario planning and foresight, as well as imaginative narratives, and it will examine examples of futures research in education, pedagogical experiments, new utopian thinking, and educational policy futures with a strong accent on actual policies and examples.
OPEN EDUCATION AND EDUCATION FOR OPENNESS

Edited by

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University of Illinois at Urbana-Champaign, USA

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University of Illinois at Urbana-Champaign, USA

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FOREWORD

As the Dean of the College at the University of Illinois at Urbana-Champaign I am delighted to be able to write a foreword to this edited collection of essays on ‘open education.’ As the editors, Michael A Peters and Rodrigo Britez explain so well in their Introduction, ‘open education’ is a project that embodies a political, economic, social and economic set of broader goals and aspirations. In one obvious sense the project of open education dates back to Enlightenment values concerning universal access to knowledge, to information and to education—values that found expression in the early prototypes and the Declaration of the Rights of Man formulated in the late eighteenth century. These particular political values and the wider set of which there are a part—values fundamentally connected to the Enlightenment narrative and struggle for freedom—received a new expression through advanced technologies in information and communication in the late twentieth century, especially through the development of the Internet. These technologies helped to design and engineer large-scale peer-to-peer architectures that encourage an ethic of mass participation and co-creation. The advent of the PC, the economics of computing and file-sharing, and the mass production of microprocessors, eventually brought down the cost of copies, distribution and dissemination providing the ideal conditions for the much touted knowledge economy and what we can think of today as the ‘open knowledge economy.’ This new paradigm of social and cultural production is a mode of the organization of knowledge that provides for the rapid spread of public knowledges and free knowledge flows across all kinds of traditional boundaries and borders, not least that set which is bound up with the development of the modern nation-state and its emphasis on a bounded territoriality and a fierce economic nationalism.

Today the promise of open education is genuinely emancipatory in grand old sense of the Enlightenment narrative based as it is on a commitment to greater and (eventually) universal access to knowledge, information and education. This is the point of ‘education for openness’ that promotes both a greater self-awareness and reflexivity about the nature and promise of open education considered as a global project, perhaps even as a commitment to the means of developing global citizenship.

The claims for open education as a new social movement remain to be seen. This collection of essays is one of the first books to examine its origins and application. The book itself, as the editors, explain emerged out of a Masters class taught by Professor Michael A. Peters and assisted by Rodrigo Britez in 2008 (“Open Source, Open Access, Open Education”) as an elective in the Global Studies Program at the College of Education. The essays are the product of assignments by students who were encouraged from the outset to consider the possibility of a publication as part of the class with the goal of investigating, popularizing, and evaluating ‘open education’. This collection is therefore also designed to demonstrate a new spirit of student, peer and student-professor collaborations that are very much a part of ‘open education’. I am more than happy
to recommend this collection as an early exploratory and experimental collection that embodies the spirit of collaboration that springs from the practice and promise of ‘open education’.

Mary Kalantziz  
Dean of Education  
University of Illinois at Urbana-Champaign,  
6th September, 2008
The essays in this collection were written for a class taught by Michael Peters. The class itself was located within a graduate program in Global Studies in Education (GSE) at the University of Illinois at Urbana-Champaign. GSE has two components: an on-line Masters program that enables teachers from around the world to have a rich and productive dialogue, beyond borders, about teaching in a world that is increasingly interconnected (see gse.ed.uiuc.edu), and an on-campus doctoral program designed to help students develop new knowledge about the complex processes of globalization and the ways in which these are reshaping educational policy and practice. Innovation and creativity lie at the heart of GSE, not only in our theorizing about global issues and futures but also in the manner in which we practice pedagogic relations. We use new technologies to broaden the scope of our learning. We try to examine old issues in education in new and fresh ways, and seek to understand the changing conditions of globalization and the educational realities to which they have given rise.

We all know how neo-liberal globalization has produced unequal and uneven social and educational consequences, and how global integration of economy, facilitated by the new developments in information and communication, has occurred in a space characterized by asymmetrical relations of power. While the notion of global connectivity has been hailed for its potential to liberate human relations from the confinement of artificial national boundaries, it is equally clear that it has disrupted, even destroyed, the lives of many people and communities. In education, while many have been able to take advantage of global interconnectivity and mobility, others have been left behind, trapped within the cycles of poverty and unequal opportunities. Despite their cosmopolitan promise, new media technologies, so often noted as the key driver of globalization, have reproduced patterns of cultural and linguistic privileges, now at a global level.

It is within this broader context of these contrasting interpretations of globalization that GSE is located. Our pedagogic challenge is not only to understand patterns of social and educational inequality but also to imagine how a different globalization might be possible – how globalized education might become an instrument of ethical possibilities that not only stresses access to literacy and technology but also considers how democratic, civil and human rights could be extended, how environmentally-friendly production systems could be promoted, how women and other historically disadvantaged groups could be empowered, and how greater intercultural understanding could be realized through greater access to information and the formation of learning communities across the globe.

The course taught by Michel Peters demanded from students an understanding of the role information and communication technologies play in global reconfigurations. More specifically it required them to think about the potential of the Open Source movement for opening up new communication systems, for promoting effective cross-cultural dialogue and for realizing the democratizing possibilities of education. The three key terms of the course – open source, open
access and open education —were constantly problematized with respect to the ways in which they might be related. In this sense, the discussion worked at each of descriptive, analytical, normative and imaginative levels simultaneously. It brought together on-campus and on-line students into a productive dialogue, challenging them to work beyond the binary between physical and virtual spaces. It encouraged students to explore some of the more complex issues surrounding new technologies and new media, and how we might interpret the notions of open source and open access in world of digital divide. But equally it explored their potential for the development of open education and open society. The notion of open itself became a key point of debate.

Each of the papers in this collection wrestles with these issues, hoping to illuminate the economic, political and cultural complexities surrounding the Open Source movement. Rather than simply repeating the celebratory rhetoric of its highly passionate advocates, these papers struggle with the challenges it poses for thinking seriously about knowledge creation, management and dissemination. I have no doubt that these papers will generate an intense and productive dialogue. No one interested in the potential of new media for realizing democratic goals — the goals of open education — can ask for any more!

Fazal Rizvi
Director, Program in Global Studies in Education,
University of Illinois at Urbana-Champaign
This collection of essays is the result of a project that has changed in multiple ways over time. The beginning of this book’s idea can be found in the online Program for Global Studies in Education (GSE) at the University of Illinois. GSE offered a space for the development of a course to study the plethora of online open education resources, which is now available for teachers and universities. Those resources are an important innovation that promise future changes for higher education.

By reflecting on the nature of open education resources, the question on openness for education emerges. What is remarkable today are the ways that teachers and institutions now begin to form part of the processes of global exchange and production of a ‘pool’ of global educational commons. The question about the significance of this development, their limits and the consequences for practitioners and institutions from the perspective of teachers is extremely complex. For example, the policy agenda of institutions, states, and international organizations related to the regulation of new technologies facilitates the existence and viability of those resources. This has consequences to the ways that those resources are used and produced by educators.

At the same time, the new paradigms of production and collaboration, pedagogy and communication of open content questions the nature, limits, and promises of openness in education through new technologies. Promises and expectations for the spread of freedom and social justice are at the core of our belief on education. The prospect of at least partially fulfilling these promises through the emergence of the open education movement is at the heart of the dialogues with teachers and students whose questions are the genesis of this collection.

We wish to acknowledge and thank Fazal Rizvi and the members, the faculty, and the students of GSE for providing us with the opportunity to bring this project forward. We also like to thank Ergin Bulut for his assistance in formatting various chapters of this book. However responsibility for any errors within the text lies with the Editors.

Finally, we would like to thank Lea Goode-Harris for graciously allowing us to use her work ‘Poetree Labyrinth’ created for the Labyrinth Guild of New England Festival 2005 as the cover of this book. Her painting can be found online at www.srlabyrinthfoundation.com.

The tree in the painting goes with a poem that makes us think about one of the purposes of this book; to explore today’s potential promises and meanings that openness offers for education.

Be joyful together,
Oh, Beloved Comforter
embrace magnificence magical Mystery,
Joy is returning from Shadow into Light
ACKNOWLEDGEMENTS

reflecting awe filled community,
Jangly, jangly, I pirouette into openness...
The creaky floor emanates warmth...
To fully expand brings light and peace...
Allowing openness, finding Blessings and coming home...
We choose to walk where we remember that we are all one...
Awakening to community and care...
I dance the shining lightness of being...
The engineers are not disturbed by the non-linearity,
Imagine the joy of the Holy now...
Open my heart, Encourage my soul,
Each step, music illuminating my soul...
A clear day and no memories!
No one is ever alone on the path to fulfillment

NOTES

1 This poem by Jeanne Colbath, Frank Sandstrom, Tricia Kibbe, Bevan C. Tulk, Beth Mace, Lucy Crichton, Mathew Gallelli, Deborah Jackson, Peter Vernam, David Strohmeyer, Karen Hope Montgomery, Nancy Ballantyne, Helen Curry, Pura Gomez, Barb Ducharme, Hallie Sawyers, Sunny Davidson, Suzan Scott Strohmeyer, Ann Boedecker, Adam Kibbe, and Mia Corinha can be found online at the website of the labyrinth foundation: www.srlabyrinthfoundation.com [blog: http://lealabyrinth.typepad.com]
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Faith McKinney was born and raised in Tokyo, Japan. Coming to America in 1979, was a reverse culture shock that had a great impact on her life. She attended Concordia University in Austin, Texas and graduated with my Bachelor of Arts in Education and Music. After teaching elementary through high school for quite a few years and working with various companies, she and her husband moved to Irvine, California in the fall of 2003 to work at Concordia University, Irvine, California. The first two years she was the Shenzhen Program Coordinator, working with teachers from Shenzhen, China who came to the university to study. In January 2006, she started working as the Master’s in Arts in International Studies Program Coordinator. It was a new program so she helped to develop and enhance the program to make it a more enriching overseas experience for our students. In May of 2008 she received her Masters of Education in Educational Policy Studies. She also began a new job at California State University in Fullerton as Program Developer for the International Programs Asia.
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**Shivali Tukdeo** is a doctoral candidate in the department of Educational Policy Studies, University of Illinois at Urbana Champaign and she has been working with Global Studies in Education program for over four years. Her doctoral research focuses on the connections between social networks, transnational advocacy groups and educational policy production. Other areas of her research interests include Language Teaching, Teacher Education and International Education.

**Gabriela Walker** is a doctoral student at the University of Illinois at Urbana-Champaign (UIUC) in the Educational Policy Studies department. Mrs. Walker obtained her B.A. and M.S. degrees in psychology and special education and, respectively, inclusive education at the University of Bucharest, Romania, and continued to study special education at the University of Georgia, U.S.A, where she earned her Education Specialist degree. Her research interests are global educational policies with an emphasis on European and special educational policies, and applied teaching methodologies with students with special needs, especially students with Intellectual Disabilities and Autism Spectrum Disorders. Gabriela’s work experiences include news-related editorial work at various newspapers in Romania, teaching children with a range of special education needs both in Romania and the U.S., and teaching undergraduate and graduate level courses in the U.S.
INTRODUCTION

Open Education and Education for Openness

Open education involves a commitment to openness and is therefore inevitably a political and social project. The concept of openness in regard to education predates the openness movement that begins with free software and open source in the mid 1980s with roots going back to the Enlightenment that are bound up with the philosophical foundations of modern education with its commitments to freedom, citizenship, knowledge for all, social progress and individual transformation. Chapter 1 explains these early origins and also the basis for open education in a variety of forms from the ‘open classroom’ to the ‘open university’. Yet in another way political, social and technological developments have taken place in parallel alongside the history of the movement of open education that have heightened certain political and epistemological features and technological enabled others that emphasize questions of access to knowledge, the co-production and co-design of educational programs and of knowledge, the sharing, use, reuse and modification of resources while enhancing the ethics of participation and collaboration. Open education as a movement sits within the broader framework of the history of openness that brings together a number of disciplines and fields to impact directly upon the value of knowledge and learning, their geographic distribution and ownership, and their organization.

Openness is a concept that has come to characterize knowledge and communication systems, epistemologies, society and politics, institutions or organizations, and individual personalities. In essence, openness in all these dimensions refers to a kind of transparency which is the opposite of secrecy and most often this transparency is seen in terms of access to information especially within organization, institutions or societies. Certainly, this is part of the meaning of openness in relation to politics and societies—openness implies a form of open government which demands that citizens have access to official information and that reasonable grounds are advanced for withholding information from the public domain. This is the basis for the movement of freedom of information that led to the passage of legislation concerned with rights to information beginning with the Freedom of Information Act passed in the U.S. in 1966 and by seventy countries around the world since then. Freedom of information means that the public has enforceable rights to access records and information held by government or public bodies. Such freedom of information is seen to be integral to democracy considered as a form of open government where government decision-making at all levels is transparent, public records are open to public scrutiny, and individuals have rights of access to such information. The doctrine of open government is related to the theory of free inquiry and the free expression of opinion based on traditional freedoms such as freedom of speech, freedom to publish, and
freedom of the press. It originates in Enlightenment philosophies that are the basis for modern theories of rights and stands against state secrecy and the use of state secrecy against its citizens.

In terms of organization and institutions, openness has come to mean a certain mode of operation characterized by cooperative or collaborative management motivated by the belief that democracy provides a set of principles not only for civil society but also for public and private organizations. Often this mode of organizational openness is associated with features of democratic procedure including open meetings, free debate, elected positions, and voting as a means of decision-making. Most often open meeting procedures are followed. Such organizations and institutions make use of flat hierarchies and consensus decision-making.

The political and organizational levels are given direct application, philosophical speaking, in the concept of the ‘open society’ which the French philosopher Henri Bergson first used to identify those dynamic societies no longer tied to a static kind of tribalism and the Viennese philosopher Karl Popper developed in the Cold War context as a concept for defending liberal politics against communism and state totalitarianism (closed societies). Karl Popper’s notion of the open society also, at least implicitly, is associated with his epistemological doctrine of critical rationalism or ‘falsificationism’ that holds that science progresses through criticism and that claims to knowledge should be open to empirical testing and falsification. In a clear sense, then, openness can also be construed as an epistemological doctrine that also implies a central role for science and philosophy as one of the central means for achieving a rational society based on its openness to criticism. Stated in this general way Popper’s doctrine is consonant with principles of criticism that begin the modern project dating from Kant’s *Critique of Pure Reason* or Descartes’ *Discourse on Method* insofar as criticism is the source of rationality and modernity both in its literary-historical as well as its scientific-technological senses.

This sort of account in its general form also allows for counter-Enlightenment strand of thinking such as Romanticism that wants to criticize and question the very commitments of modernity by pointing to the pitfalls of rationalism and forms of rationalization in modern society that have compromised freedom and led to excessive regimentation and bureaucratization of society. The ecological critique of industrialism might also be seen to belong to this counter-Enlightenment form of criticism as might some forms of postmodernism.

Open education in terms of its most recent developments cannot be separated from the development of open systems and the history of open source, open access, open archiving, and open publishing. Education has always been dependent to some degree on changing information and communication technologies from the abacus and stone tablet to the blackboard and computer. The more critical questions is to understand how these new technologies, and especially Web 2.0 platforms and protocols, promote a ubiquitous learning that collapses spaces between school and home, work and school, work and personal interest, teacher and student and so on, transforming formal education and the market and creating new forms of social production that are essential to the knowledge economy.
Openness also has a line of thinking that directly ties it to individuals and their psychological make-up. Openness is one of the five personality traits empirically established in research dating from the 1930s that has come to serve as a model of personality (along with conscientiousness, extraversion, agreeableness, and neuroticism). Openness is sometimes interpreted as ‘intellect’, seen as ‘openness to experience’ and associated with appreciation of art, curiosity, adventure and the imagination. Open people who are regarded as experimental, creative, curious, less thrown by complexity and subtlety, are contrasted with closed people who may be more conservative, less flexible, more bound by habit, resistant to change, and tied to the security of a familiar environment. We might even talk loosely here of open personalities as ‘global’ personalities. Openness in this context has a great deal to do with education for it has been argued since days of Rousseau and ‘philosophers of free play’ for children (Pestalozzi, Froebel, Montessori and even Dewey) that openness to experience is an educational important value and that unstructured play (freedom) is one of the best ways of encouraging curiosity and experiment.

It is clear that there is a vital historical and political framework that embraces a variety of perspectives of freedom and openness that are part of the commitments of open education—commitments that lie deeply woven into the fabric of modern education as it developed during the Enlightenment and thereafter. Part of the project of education for openness is to identify and to recognize these deep commitments and to provide a theoretical context for viewing and understanding claims to openness and freedom in education within this context. Education for openness is about a meta-awareness of the political, social, economic and technological frameworks that enable and permit greater world democratic use and reuse of educational resources and programs through new technologies enhancing the virtues of openness such as the ethics of participation, collaboration and co-production, co-design and co-evaluation of all aspects of education. In this way education for openness is also about exploring the possibilities of open education in both its historical and future perspectives, and the encouragement of greater dialogue across all boundaries. In this sense the project has a world-historical component that is visionary in its commitment to principles of open inquiry, open access, open collaboration and leadership, and to education role in promoting open democracy at a grass-roots level, that is, through the everyday actions of students and teachers who communicate and exchange ideas and resources across time and space.

Open education and education for openness are related projects and perhaps one of the most significant educational movements to surface in the twenty-first century.

About this book

This book originated as part of an online-only course delivered in the Department of Educational Policy Studies at University of Illinois at Urbana-Champaign by Michael A Peters with the graduate assistance of Rodrigo Britez. The course entitled Open Source, Open Access, Open Education was developed by Peters and Britez as part of the new Masters Global Studies in Education Program. The course
was developed in 2007 and taught for the first time in 2008. The course description reads as follows:

The present decade can be called the ‘open’ decade (open source, open systems, open standards, open archives, open everything) just as the 1990s were called the ‘electronic’ decade (e-text, e-learning, e-commerce, e-governance). This course will introduce course participants to the emergent paradigm of Open Education (OE): first, by setting the scene briefly outlining the challenges of higher education represented by globalization, the knowledge economy and the development of e-learning; second, by reviewing and concept and contemporary forms of ‘openness’, including open source, open access and the ‘open society’; third, by providing a grounding in the state of the field of open education, including related topics like copyright, licensing and sustainability; and, fourth, by encouraging you to think and act creatively about current practices and possible alternative practices in open education.

The course sessions had the common purpose of inviting the reflexion and exploration on the current meanings of open education and openness for educators, learners and higher education institutions. It included the study of major reports about Open Education, lectures and discussions exploring ‘openness’ and the meaning of open society, and explored the more important open education projects. Furthermore, it included discussions on open access, open source, copyright and the public domain and the ways in which educators are licensing open education resources.

Each session was organized as an exercise to answer and ask questions about some of the crucial challenges that the growing provision of open education alternatives through new informational technologies seem to promise for education. Examples of recurrent questions were: what is open education and why this idea should be pursued through open access to free, high-quality educational opportunity? In which ways is it pursued today by education institutions and how this is related not only to informational technologies but to new economic paradigms of organization and production? What are the purposes of open education and how will the future of higher education look like as result of this development?

All these questions and many more that emerged from the discussions and rich debates attempted to offer a glimpse on Open Education and Openness, their consequences, practice and limits, which are echoed through the chapters of this book.

The Organization of this Book

This volume is organized in three parts. The first part is concerned with the ways in which new technologies create new possibilities and boundaries for the participation in and access to education. The chapters in this part are concerned with complex questions about the implicit paradigm of openness and collaboration in education that these developments promise. In considering these issues, this part illustrates the way in which a more ‘democratic’ system of knowledge production and distribution still operates through an overlapping and diverse assembly of
institutional and technological boundaries that are defining the limits and potential future of Open Education projects.

As Daniel Araya points in chapter 2, one of the fundamentals of new systems of innovation anchored in new technologies is their potential for advancing systems of education. However, the implications of open education for institutions of education, as Michael Peters indicates, are still related with contested ideas about the meaning, of the ethics of openness and freedom that predate the emergence of informational technologies.

The final two chapters of the first part by Rodrigo Britez and Shivali Tukdeo, provide nuanced accounts on the ways that the promises of openness in education are related with practical and ethical questions about political freedom, access and the role of states and global institutions in the regulation of technological infrastructures. These chapters indicate that the power and reach of new forms of participation, collaboration and innovation in education through new informational technologies is contingent on the development of specific policy environments for society at large attuned with values of transparency, participation, intellectual and political freedom for the production and access to knowledge not limited to education institutions nor subservient on the needs of a ‘global knowledge economy’.

The implications of open education are producing distinct impacts at the local, national, regional and global level, and they vary according to the different policy and socio-economical contexts in which they are implemented. The four chapters in this part explore the development of open source and open access initiatives in Latin America, Africa, Rumania and China. These chapters show the challenges and uneven institutional, political, economical and technological terrain in which open education initiatives are taking place. Heidi A. Knobloch describes Africa’s biggest problems of poverty, debt, food insecurities, and lack of clean water not only as negatively affecting the development of individuals but also as hindering future development by nations by impeding the free flow of educational opportunities. Will Montepeque explores the Open Source movement and the challenges and opportunities that the provision and access to educational resources through digital technologies creates for Latin American countries. An interesting question that this chapter evokes on the shared difficulties with countries in the African context is: How can developing countries provide more technology in the classroom or society if they cannot provide communities with textbooks and supplies for schools? As Gabriela Walker’s chapter on Romania’s open source and education initiatives indicates, Information and Communication Technology (ICT) has the potential for a powerful impact on the development of educational opportunities in the twenty first century. The chapter describes the global nature, of pressures and challenges impelling the emergence of open education initiatives through the prism of the global digital connect and disconnect and Romania’s contribution to the development of open source. The final chapter of this part, by Lucinda Morgan, is concerned with the role of the Chinese government in fostering open education and open source initiatives at the same time that it pursues the construction of censorship systems for information, hindering the access to internet
resources. The article provides nuances on the important role that the Chinese state policies play in fostering or hindering open source, open access, and online education initiatives. Among those, issues of language, quality and absence of regulated standards for the provision of online education offer a complex picture of the current state of those initiatives.

In final part of the book, Linda Smith Tabb and Faith McKinney explore the pedagogical practices implicit in the open education paradigm and the use of new informational technologies. Faith McKinney reviews the way in which open education initiatives are creating an array of open educational resources for teachers. At the same time, the chapter indicates the new challenges for educators in teaching using the open content of K-12 learning resources available online in the United States today. Among those, there are problems of access to basic infrastructure in schools, and technological gaps for different groups of teachers and students. The chapter indicates that lack of training, access to technological support and equipment are still noticeable for particular demographic and geographic groups. In these instances the author asks the following important question about the reach of open education resources in a context in which enormous disparities are observed in advanced industrial countries like the U.S.: ‘how can we expect them to be accessed from other countries that have less technology access than the United States?’

In the final chapter, Tabb explores the ways in which language learning supported by open content and tools online could provide interesting possibilities in the field of second language acquisition. The chapter shows some of the most recent research and theories highlight some advantages of the open education ecosystem, at a time when there is a disconnect between policy and best practices in the United States, in the area of foreign language education.

This books ends with a challenge for those engaged in exploring the potential impacts and possibilities of open education initiatives. The open education paradigm and its consequences for educators and learners speak of an uneven geography where the access to technological infrastructure does not necessarily imply freedom or openness. In those instances, openness in education related to open education initiatives requires an engagement in research about the ways in which policy, cultural, digital and educational environments facilitate a political commitment to open systems of knowledge production and distribution.

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THEORETICAL AND PHILOSOPHICAL CONSIDERATIONS
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1. THE HISTORY AND EMERGENT PARADIGM OF OPEN EDUCATION

_We cannot teach another person directly; we can only facilitate his learning._
Carl Rogers, 1969

_The operation of a peer-matching network would be simple. The user would identify himself by name and address and describe the activity for which he sought a peer. A computer would send him back the names and addresses of all those who had inserted the same description. It is amazing that such a simple utility has never been used on a broad scale for publicly valued activity._ —Ivan Illich, 1971

INTRODUCTION

On February 14 2008 Harvard University’s Faculty of Arts and Sciences adopted a policy that requires faculty members to allow the university to make their scholarly articles available free online. The new policy makes Harvard the first university in the United States to mandate open access to its faculty members’ research publications (Suber) and marks the beginning of a new era that will encourage other U.S. universities to do the same. Open access, to use Suber’s definition, means ‘putting peer-reviewed scientific and scholarly literature on the internet, making it available free of charge and free of most copyright and licensing restrictions, and removing the barriers to serious research.’ As Lila Guterman reports in _The Chronicle of Higher Education News Blog_ ’Stuart M. Shieber, a professor of computer science at Harvard who proposed the new policy, said after the vote in a news release that the decision “should be a very powerful message to the academic community that we want and should have more control over how our work is used and disseminated.’’

Open access has transformed the world of scholarship and since the early 2000s with major OA statements starting with Budapest in 2002 movement has picked up momentum and developed a clear political ethos. Harvard’s adoption of the new policy follows hard on the heels of open access mandates passed within months of each other – the National Institutes of Health (NIH) and the European Research Council (ERC). As one blogger remarked: ‘open archiving of peer-reviewed journal literature [is] now on an irreversible course of expansion’ not only as U.S. universities follow Harvard’s lead but also as open archiving makes available learning material to anyone including students and faculty from developing and

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transition countries. Harvard’s adoption of the open archiving mandate is similar in scope to the step taken by MIT to adopt OpenCourseWare (OCW) in 2001. These initiatives are part of *emerging knowledge ecologies* that will determine the future of scholarly publishing challenging commercial publishing business models and raising broader and deeper questions about content development processes as well as questions of resourcing and sustainability.

The Ithaca Report, *University Publishing In A Digital Age* (2007) indicates that there have been huge changes in creation, production and consumption of scholarly resources with the ‘creation of new formats made possible by digital technologies, ultimately allowing scholars to work in deeply integrated electronic research and publishing environments that will enable real-time dissemination, collaboration, dynamically-updated content, and usage of new media’ (p. 4). As the report goes on to mention alongside these changes in content creation and publication ‘alternative distribution models (institutional repositories, pre-print servers, open access journals) have also arisen with the aim to broaden access, reduce costs, and enable open sharing of content’ (p. 4).

We can consider open publishing, open access and archiving as parts of the wider movement called *Open Education* that builds on the nested and evolving convergences of open source, open access and open science, and also emblematic of a set of still wider political and economic changes that ushers in ‘social production’ as an aspect of the global digital economy, an economy that is both fragile and volatile as the current world credit and banking crisis demonstrates so well. The present decade can be called the ‘open’ decade (open source, open systems, open standards, open archives, open everything) just as the 1990s were called the ‘electronic’ decade (e-text, e-learning, e-commerce, e-governance) (Materu, 2004). And yet it is more than just a ‘decade’ that follows the electronic innovations of the 1990s; it is a change of philosophy and ethos, a set of inter-related and complex changes that transforms markets and the mode of production, ushering in a new collection of values based on openness, the ethic of participation and peer-to-peer collaboration. In a fundamental sense it also represents the continuation of a meta-story, albeit in a new register, of freedom. In the postscript to *Building Knowledge Cultures: Education and Development in the Age of Knowledge Capitalism* (Peters & Besley, 2006) we made the argument that there has been a shift from an underlying metaphysics of production—a ‘productionist’ metaphysics—to a metaphysics of consumption and we must now come to understand the new logics and different patterns of cultural consumption in the areas of new media where symbolic analysis becomes a habitual and daily activity. Here the interlocking sets of enhanced mobility of capital, services, and ideas, and the new logics of consumption become all important. These new communicational practices and cross-border flows cannot be effectively policed. More provocatively we might argue, the global informational commons is an emerging infrastructure for the emergence of a civil society still yet unborn.
We also emphasized the link of this new logic of consumption to a classical concept of freedom:

Information is the vital element in a ‘new’ politics and economy that links space, knowledge and capital in networked practices. Freedom is an essential ingredient in this equation if these network practices develop or transform themselves into knowledge cultures. The specific politics and eco-cybernetic rationalities that accompany an informational global capitalism comprised of new multinational edutainment agglomerations are clearly capable of colonizing the emergent ecology of info-social networks and preventing the development of knowledge cultures based on non-proprietary modes of knowledge production and exchange.

Since writing these words my research has focused increasingly on issues to do with the production and consumption of knowledge within the digital knowledge economy and a special focus on the notion of ‘openness’ considered in epistemological, ethical and political terms. At the University of Illinois (Urbana Champaign) I have been involved in a number of courses, journal issues and publications that explore the dimensions of ‘open knowledge production systems,’ a term I first used in 2007 in an introduction to a symposium in the journal Policy Futures in Education to discuss John Willenski’s (2006) excellent book The Access Principle: The Case For Open Access To Research And Scholarship. As Editor of the journal Policy Futures in Education, I published Cushman Kapitzke’s special issue on the ethics of copyright and patents with John Willinski and Richard Stallman (Director of the Free Software Foundation) as contributors among others. This issue was later published in revised form as Global Knowledge Cultures (Kapitkze and Peters, 2007) together with an essay I wrote on ‘informational democracy’.


I built upon the work of Building Knowledge Cultures with a book entitled Knowledge Economy, Development and the Future of the University (Peters, 2007a) that reflects on the role of the modern university in a global networked economy. I gave a keynote address at the Spanish Research Council’s sponsored Conference on the Book (Common Ground Publishing) at the invitation of my colleague Professor Bill Cope, held in Madrid late 2007 ‘Opening the Book’ (Peters, 2007b). In this paper I discuss one aspect of messianic line of thinking about e-texts that I have called simply ‘openness’ going back to Walter Benjamin and entertain the concept of ‘open knowledge production systems’ that in my view will not mean the ‘end of the book’ but its radical subsumption in a new electronic
textual system involving a set of changes in all aspects of the ‘culture of the book’ including all phases of its creation, production and consumption as well as its practices and institutions of reading and writing.

In terms of courses I have held a number of Advanced Seminars at the University of Illinois at Urbana-Champaign, including: ‘Knowledge Futures in Higher Education: Knowledge, Freedom and Development’ which included a linkup to World University Network’s (WUN) Horizons Virtual Seminar Series: Global Knowledge Futures (2005); ‘Education and Development in Higher Education’ (with Fazal Rizvi) (2006); ‘Knowledge Systems, Scientific Communication & Academic Publishing in Higher Education’ (with Bill Cope) (2007); as well as a number of online-only classes at the Masters level using Moodle and Elluminate, including ‘School-based project in Internationalization’ (2007); ‘Open Source, Open Access, Open Education’ (2008); and ‘Global Citizenship Education’ (2009). I mention these classes because for me there is a very strong link between teaching and research and working with graduate students. I use these class sessions to theorize much of the work that later appears in published work. The experience and practice of e-learning, online teaching and e-publishing work is a necessary part of the ability to theorize.

This chapter builds on those experiences and embodies a variant of the same story continuing the same line of argument by providing a history of ‘open education’ and theorizing the emergent paradigm of Open Education (OE). The term ‘open educational resources’ first came into use at a conference hosted by UNESCO in 2002 where it was defined as ‘the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for noncommercial purposes.’ As the OECD report (2007: pp. 30–31) notes:

The definition of OER now most often used is: “open educational resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research”. To clarify further, OER is said to include:

– Learning content: Full courses, courseware, content modules, learning objects, collections and journals.
– Tools: Software to support the development, use, reuse and delivery of learning content, including searching and organisation of content, content and learning management systems, content development tools, and online learning communities.

In the first section this chapter provides a very brief history of ‘openness’ in education by linking it to a successive series of utopian historical moments based on a set of similar ideas stemming from core Enlightenment concepts of freedom, equality, democracy and creativity. In the second section it plots the dimensions of the emerging paradigm of Open Education by reviewing four major reports that have been released during the last year or two.
THE HISTORY AND EMERGENT PARADIGM OF OPEN EDUCATION

THE UTOPIAN HISTORY OF ‘OPENNESS’ IN EDUCATION: FROM THE OPEN CLASSROOM TO OCW

We can group the appearance of the notion ‘openness’ in education around a successive series of utopian historical moments based on a set of similar ideas stemming from core Enlightenment concepts of freedom, equality, democracy and creativity. The early history of open education consists political and psychological experiments conducted in special schools established in the early twentieth century. The movement from the very beginning thus was shaped by contemporary political and psychological theory that attempted to provide alternatives to the mainstream that was connected to and exemplified a form of society and set of institutions that was seen as politically desirable. These early ideas that also significantly involved an analysis of the space and architecture of schools and the associated idea of freedom of movement underwent considerable refinement and development over the course of the twentieth century. An important aspect concerned not only the analysis of architecture but also the overcoming of distance in a form of distance education that began in the late nineteenth century through correspondence and progressed through various media eras including that of radio and television. ‘Open education’ consisted of several strands and movements that often coalesced and overlapped to create a complex skein that despite the complexity was able to rapidly avail itself of new communication and information technologies in the last decade of the twentieth century and to identify itself more broadly with the new convergences among open source, open access, and open courseware movements. It was as though the open education movement in its infancy required the technological infrastructure to emerge as a major new paradigm rather than a set of small-scale and experimental alternatives or a form of distance education. We can chart these utopian moments in terms of five historical moments:

- The Open Classroom;
- Open Schooling;
- The Open University;
- Open Courseware;
- Open Education.

The movement for openness in education was anticipated by a range of models after those of Homer Lane and A.S. Neill and, to a lesser degree, Bertrand Russell’s libertarian school, all established in the early twentieth century. All three thinkers were wedded to the classical enlightenment doctrine of freedom and autonomy in education even though they tended to give it expression through then contemporary psychological theory influenced by Freud concerning child rearing. Lane established Little Commonwealth at Evershot, Dorset in 1913. Influenced by the group therapy movement he emphasized ‘shared responsibility’ and freedom of ‘self-expression.’ A.S. Neill, a follower of both Lane and Wilhelm Reich, the controversial psychoanalyst, established Summerhill in 1921 on the basis of a concept of personal freedom and equality that he held were important for learning and the development of self. Ideas of freedom and democracy also figured in Carl Rogers’ (1969) *Freedom to Learn* written under the influence of the therapeutic movement including Otto Rank and existentialist philosophers like Martin Buber and Søren Kierkegaard.
Rogers emphasized ‘self-directed learning’ and facilitation rather than teaching as he entertained strong doubts about the necessary connection between teaching and learning. In the same environment Everett Reimer’s and Ivan Illich’s influential works during the 1970s, most famously in Deschooling Society (Illich, 1972), argued formal education had confused schooling and education and created a kind of psychological impotency that delivered a stultified and non-creative uniformity.

In a broad sense these ideas were also given a concrete expression in the ‘open classroom’ movement which originated in Leicestershire and was based on freedom of movement, the importance of ‘play’ and a novel analysis of the space and architecture of schools. In Britain the movement became known as ‘informal education’ based on ‘learning by doing’ in home-like settings or ‘learning centers’ where pupils were encouraged to be self-directed and creative in ‘schools without walls’. The Plowden Report (1966) in the UK outlined a philosophy of primary schooling based on Piagetian stage theory that emphasized children as individuals and supported a move to child-centered methods and curricula suited to the ‘needs of the child.’ Open schooling as ‘informal education’—informed by both Romantic thinkers like Rousseau, Pestalozzi, and Froebel and later, of course, Dewey—emphasized process over structure, dialogue rather than formal instruction, democracy rather than control, freedom and self-expression over teacher-directedness and authority. A number of texts of the time explored the relation between open education, freedom and knowledge (Nyberg, 1975), the relation between the open school and the open society (Puckrose, 1975), or emphasized the link with ‘community’ and the move away from hierarchy (Easthope, 1975).

Informal education tended to emphasize alternatives based on opening up traditional processes and structures of the school and decoupling the school from specific location or internal architecture, an age-cohort, or dependent upon a single source of authority. The unschooling, homeschooling and community-schooling movements, for instance, focused on self-direction (autodidacticism) and harnessing community institutions and resources found in museums, local libraries and even mass media. The informal education movement also had strong links with ‘adult education’ and, later, the concept of lifelong learning.

Distance education began in the late nineteenth century and was initially based on correspondence a tradition based on early international science that survived in ‘correspondence schools’ where children were isolated in rural areas and separated from local schools by great distances. Instructional radio was introduced much later though its utopian promise was never fulfilled. Similar when instructional television began transmitting courses in the early 1930s. The model of technology-based distance education really received its impetus in the 1960s when the Open University in the UK was established founded on the idea that communications technology could extend advanced degree learning to those people who for a variety of reasons could not easily attend campus universities. It is interesting that the Open University really began with the BBC and ideas for a ‘wireless university’ or ‘teleuniversity’ that could combine broadcast lectures with correspondence texts and visits to local universities. From the start the idea of the ‘open university’ was conceived as a response to the problem of exclusion. The Open University (http://www.open.ac.uk/)
advertises itself as based on ‘open learning’ which is explained in terms of ‘learning in your own time by reading course material, working on course activities, writing assignments and perhaps working with other students.’ The Open University has around 150,000 undergraduate and more than 30,000 postgraduate students. 10,000 of our students have disabilities. It has been immensely influential as a model for other countries and distance education flourished in the 1970s and picked up new open education dimensions with the introduction of local area network environments.10

Open courseware (OCW) is very much a feature of the twenty-first century. MIT, one of the first universities to introduce OCW, announced its intention in the New York Times in 2001, formed the OpenCourseWare Consortium in 2005, and by 2007 published virtually all its courses online. This is how the MIT website expresses the history of OCW

MIT OpenCourseWare is an idea – and an ideal – developed by the MIT faculty who share the Institute’s mission to advance knowledge and educate students in science, technology, and other areas of scholarship to best serve the world. In 1999, the Faculty considered how to use the Internet in pursuit of this goal, and in 2000 proposed OCW. MIT published the first proof-of-concept site in 2002, containing 50 courses. By November 2007, MIT completed the initial publication of virtually the entire curriculum, over 1,800 courses in 33 academic disciplines. Going forward, the OCW team is updating existing courses and adding new content and services to the site. (http://ocw.mit.edu/OcwWeb/web/about/history/index.htm)

OCW does not grant degrees nor provide access to faculty. Site statistics show that 49% of users are by self-learners, 32% by students and 16% by teachers. The OpenCourseWare Consortium11

is a collaboration of more than 100 higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model. The mission of the OpenCourseWare Consortium is to advance education and empower people worldwide through opencourseware.

On November 28 2207 MIT celebrated the initial publication of the entire MIT curriculum on OpenCourseWare with a conference called Unlocking Knowledge, Empowering Minds with a keynote by Thomas Friedman and a symposium panel on the future of OCW and education with Harold Abelson (Moderator) Professor, Electrical Engineering and Computer Science, MIT, Charles Vest, President, National Academy of Engineering, President Emeritus, MIT, John Seely Brown. Former Chief Scientist, Xerox Corporation and San Pitroda Chairman, National Knowledge Commission, Government of India.12 Steven Lerman, Dean for Graduate Students, MIT, in his presentation mentioned that MIT OpenCourseWare has reached 35 million people and another 14 million in translation.

MIT is of course only one example of the OpenCourseWare movement, an important player, but nevertheless, only one institution amongst many.13 Most
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recently The Cape Town Open Education Declaration subtitled ‘Unlocking the promise of open educational resources’ arose from a meeting convened in September 2007. The declaration begins:

We are on the cusp of a global revolution in teaching and learning. Educators worldwide are developing a vast pool of educational resources on the Internet, open and free for all to use. These educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge. They are also planting the seeds of a new pedagogy where educators and learners create, shape and evolve knowledge together, deepening their skills and understanding as they go.

This emerging open education movement combines the established tradition of sharing good ideas with fellow educators and the collaborative, interactive culture of the Internet. It is built on the belief that everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint. Educators, learners and others who share this belief are gathering together as part of a worldwide effort to make education both more accessible and more effective.

The Declaration mentions the expanding global collection of OCW as the basis for this development, although in terms of the history it is clear that origins and strands of the movement go back much further. The document also mentions the variety of openly licensed course materials, including lessons, games, software and other teaching and learning materials that contribute to making education more accessible and help shape and give effect to a ‘participatory culture of learning, creating, sharing and cooperation’ necessary for knowledge societies. Perhaps, most importantly, the Declaration indicates that open education ‘is not limited to just open educational resources…[but] also draws upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues. It goes on to provides a statement based on a three-pronged strategy designed to support ‘open educational technology, open sharing of teaching practices and other approaches that promote the broader cause of open education.’14

The open education movement and paradigm has arrived. It emerges from a complex historical background and its futures are intimately tied not only to open source, open access and open publishing movements but also to the concept of the open society itself and its meanings.

THE EMERGING PARADIGM OF OPEN EDUCATION

What is now called simply ‘open education’ has emerged strongly as a new paradigm of social production in the global knowledge economy. In the last year or so four major reports have documented existing developments and new tools and technologies, heralded the utopian promise of ‘openness’ in global education extolling its virtues of shared commons-based peer-production and analyzed the ways in which it contributes to skill formation, innovation and economic development.
The powerful Washington-based Committee for Economic Development released its report *Open Standards, Open Source, and Open Innovation: Harnessing the Benefits of Openness* in April 2006 examining the phenomenon of ‘openness’ in the context of today’s digital economy highlighting the key attributes of accessibility, responsiveness, and creativity and commenting on the relevance of three areas of open standards, open-source software, and open innovation. The report by The Digital Connections Council of The Committee For Economic Development built on three earlier reports dating from 2001: *The Digital Economy and Economic Growth* (2001), *Digital Economy: Promoting Competition, Innovation, and Opportunity* (2001) and *Promoting Innovation and Economic Growth: The Special Problem of Digital Intellectual Property* (2004). These reports emphasized intellectual property issues involved with file-sharing and peer-to-peer networks and the way that ‘heavy-handed enforcement of intellectual property rules and reliance on business practices designed for the trade of physical goods can stifle the collaboration and innovation that is vital to the growth of the digital economy.’ What is perhaps of greatest interest in the present context is the emphasis in the new report on what they call ‘open innovation’ – new collaborative models of open innovation, originating outside the firm, that results in an ‘architecture of participation’ (Tim O’Reilly)—and to a lesser extent their definition of ‘openness’. This is what the report says about ‘open innovation’:

Open innovation can be seen in the growing use of digital software tools tied to computer-controlled fabrication devices that allow users to design an object and then produce it physically. As the costs of these digital design tools decrease, users are able to innovate, breaking the model of manufacturers being the source of innovation and customers simply consuming them. The openness model, the antithesis of a “not invented here” attitude, encompasses not only manufacturers and users, but suppliers whose innovations should be welcomed by the companies they supply. (Executive Summary).

The report goes on to mention ‘the extraordinary increase in “peer production” of digital information products’ which are produced by individuals without any expectation of monetary gain and commenting that ‘sophisticated commercial firms are harvesting the benefits of openness.’ In this same context they mention the movement of ‘open science’ promoted by the National Institutes of Health (NIH) and the model of open courseware on which they comment:

Advocates for more openness contend that openness will result in greater innovation than would be achieved by restricting access to information or allowing first creators to exert greater control over it. Such a belief in the value of tapping the collective wisdom is profoundly democratic.

What is remarkable about this set of statements is the link between firm innovation, what we might call open education and the emergence of the paradigm of social production (more about this concept later).

In 2007 three substantial reports were released that reviewed open education as a movement and assessed its benefits: The OECD’s (2007) *Giving Knowledge for
Free: The Emergence Of Open Educational Resources\(^{16}\); Open e-Learning Content Observatory Services (OLCOS) project and report entitled Open Educational Practices and Resources\(^{19}\); A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities (Eds. Atkins, Brown & Hammond, 2007), a report to The William and Flora Hewlett Foundation\(^{20}\). These three reports share similar emphases each focusing on 'openness' and the promise of the new technologies and their educational benefits.

The OECD report focuses on four questions:

- How can sustainable cost/benefit models for OER initiatives be developed?
- What are the intellectual property rights issues linked to OER initiatives?
- What are the incentives and barriers for universities and faculty staff to deliver their materials to OER initiatives?
- How can access and usefulness for the users of OER initiatives be improved? (pp. 3–4, Foreword)

The Executive Summary gives us a flavor of the potential of OER\(^{21}\) and the utopian educational promise that graces these three reports:

> An apparently extraordinary trend is emerging. Although learning resources are often considered as key intellectual property in a competitive higher education world, more and more institutions and individuals are sharing digital learning resources over the Internet openly and without cost, as open educational resources (OER). (p. 9).

The report then concerns itself with the following questions: What are open educational resources? Who is using and producing OER and how much? Why are people sharing for free? What are the provisions for copyright and open licences? How can OER projects be sustained in the long run? alongside a set of policy implications and recommendations.

The OLCOS report, by comparison, focuses on: Policies, institutional frameworks and business models; Open Access and open content repositories; and Laboratories of open educational practices and resources, warning against instituting open education within the dominant model:

OER are understood to be an important element of policies that want to leverage education and lifelong learning for the knowledge economy and society. However, OLCOS emphasizes that it is crucial to also promote innovation and change in educational practices. In particular, OLCOS warns that delivering OER to the still dominant model of teacher centred knowledge transfer will have little effect on equipping teachers, students and workers with the competences, knowledge and skills to participate successfully in the knowledge economy and society. This report emphasises the need to foster open practices of teaching and learning that are informed by a competency-based educational framework. However, it is understood that a shift towards such practices will only happen in the longer term in a step-by-step process.
Bringing about this shift will require targeted and sustained efforts by educational leaders at all levels (p. 12).

In Chapter 4 ‘Competences for the knowledge society’ the report opines ‘priority must be given to open educational practices that involve students in active, constructive engagement with content, tools and services in the learning process, and promote learners’ self-management, creativity and working in teams’ (p. 37) and ‘introduces the idea of value chains of open educational content which emerge when teachers and students re-use available content and make enriched and/or additional material (e.g. use cases, experiences, lessons learned, etc.) available again to a larger community of practice’ (p. 37). The report defines a competency-focused, collaborative paradigm of learning and knowledge acquisition where ‘priority is given to learning communities and development of knowledge and skills required for tackling and solving problems instead of subject-centred knowledge transfer.’ The report argues:

We believe that, to acquire the competences and skills for personal and professional achievement in the knowledge-based society, the learner’s autonomy, personal mastery and self-direction must be acknowledged and innovative approaches implemented that foster self management, communication and team skills, and analytical, conceptual, creative and problem solving skills. However, there is of course a huge difference between identifying required competences and operationalising them for inclusion in the concrete practices of teaching and learning at different educational levels (p. 39).

The report then lists the following skills of ‘digital competence’

- Ability to search, collect and process (create, organise, distinguish relevant from irrelevant, subjective from objective, real from virtual) electronic information, data and concepts and to use them in a systematic way;
- Ability to use appropriate aids (presentations, graphs, charts, maps) to produce, present or understand complex information;
- Ability to access and search a website and to use internet-based services such as discussion forums and e-mail;
- Ability to use ICT to support critical thinking, creativity and innovation in different contexts at home, leisure and work (p. 39).

The report to The William and Flora Hewlett Foundation is perhaps, the most comprehensive even although it follows similar lines of investigation to the others but frames the report in terms of Amartya Sen’s work with the plan to develop ‘a strategic international development initiative to expand people’s substantive freedoms through the removal of “unfreedoms”’. What is impressive about this report is not only the inventory of open education projects (the incubation of high-quality specialized open resources) but also its attempt to conceptualize the issues and to move to a new understanding of openness in terms of an ethic of participation (and the design of ‘open participatory learning infrastructure’) that
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supports the role of technology in emphasizing the social nature of learning and its potential to address questions of the digital divide in developing countries.

There is much else that deserves attention in these reports. While they touch on conceptual issues to do with openness they do not often make the necessary theoretical links to the wider literature. They do not explore the concept of openness itself, nor investigate its history in the development of open systems. It is important to realize that today’s ‘open education’ is not just a happy coincidence of technology and inclination, online learning and Web 2.0 technologies. Open education as an emergent paradigm has a history that provides much of the context and the motivating values. It is part of the Enlightenment story of freedom and it cannot be separated from wider political questions concerning epistemology, ontology and ethics.

NOTES

1 See Peter Suber’s blog at http://www.earlham.edu/~peters/fos/fosblog.html.
3 See the comment by Ray English on the same site.
4 The Association of College and Research Libraries (ACRL) recently released their research agenda for scholarly publishing around eight themes: The impact and implications of cyberinfrastructure; Changing organizational models; How scholars work; Authorship and scholarly publishing; Value and value metrics of scholarly communications; Adoptions of successful innovations; Preservation of critical material Public policy and legal matters. See http://www.acrl.ala.org/sereresearchagenda/index.php?title=Main_Page.
5 See the website for the journal at http://www.wwwords.co.uk/pfie/index.asp
7 Ubiquity magazine has received permission to publish an excerpt (Introduction and Chapter 11). The excerpt is available at http://www.acm.org/ubiquity/views/v8i18_peter.html. Ubiquity associate editor A. Tripathi writes of it: ‘Prophetically, almost thirty years ago Jean-François Lyotard forecast the end of the modern research university based on Enlightenment principles. He envisaged the emergence of technical institutes in the service of the information-rich global multinationals. This book reflects on the post-war Western university and its discourses charting the crisis of the concept of the modern university. First, it examines the university within a global networked economy; second, it adopts poststructuralist perspectives in epistemology, politics and ethics to appraise the role of the contemporary university; third, it introduces the notion of ‘development’ in a critical fashion as a way of explaining its potentially new regional and international learning roles; fourth, it analyses the rise of global science and the disciplines in the context of the global economy; and, finally, it raises Lyotard’s “logic of performativity” and the assessment of research quality within a neoliberal economy, linking it firmly to the question of freedom and the republic of science.
8 See http://www.wun.ac.uk/cks/teaching/horizons/horizons.html for the six presentations in the series.
9 This course, perhaps closest to the concerns of this paper, theorizes the emergent paradigm of Open Education (OE): ‘first, by setting the scene briefly outlining the challenges of higher education represented by globalization, the knowledge economy and the development of e-learning; second, by reviewing and concept and contemporary forms of ‘openness’, including open source, open access and the ‘open society’; third, by providing a grounding in the state of the field of open education, including related topics like copyright, licensing and sustainability; and, fourth, by encouraging innovation concerning current practices and possible alternative practices in open education’ (Course description).

14
THE HISTORY AND EMERGENT PARADIGM OF OPEN EDUCATION

10 See, for example, the Indian Open Schooling Network (IOSN) at http://www.nos.org/iosn.htm, the National Institute of Open Schooling at http://www.nos.org/, and Open School BC (British Columbia) at http://www.pss.gov.bc.ca/osbc/.
11 At http://www.ocwconsortium.org/index.php?option=com_content&task=view&id=15&Itemid=29
12 The videos are available for viewing at http://ocw.mit.edu/OcwWeb/web/about/milestone/index.htm
13 See the OpenCourseWare Consortium for the full list of participating countries and list of courses at http://www.ocwconsortium.org/
14 The full declaration can be found at http://www.capetowndeclaration.org/read-the-declaration.
15 See the website http://www.ced.org
17 Digital versions are available on their website at http://www.ced.org/projects/ecom.shtml
18 Available electronically at http://www.oecd.org/document/41/0,3343,en_2649_201185_38659497_1_1_1_1,00.html
19 Available at http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf
21 I prefer the term OE to OER because it embraces the notion of practices as well as the notion of sharing educational resources and also because it gels with open source, open access, and open science (as well as open innovation).

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2. THE DEMOCRATIC TURN

Prosumer Innovation and Learning in the Knowledge Economy

INTRODUCTION

As Eric Von Hippel (2005) has pointed out, the distributed nature of information and communications technologies is enabling an emergent mode of economic production that is best described as “democratic innovation”. Looking at democratic innovation from the perspective of complexity theory, I will suggest that the nature of socioeconomic production is becoming increasingly anchored to “prosumer innovation” networks. Building out from information and communications networks (ICNs), prosumer innovation blurs the boundaries between producers and consumers, joining both categories to broader systems of creative cooperation. This chapter will explore the contours of prosumer innovation and consider its potential for advancing systems of education. Focusing on prosumer innovation as an emergent cultural practice, I will suggest that the democratization of knowledge and learning should be the locus of concern for educational policy-makers over the coming decades.

THE DEMOCRATIC TURN: ICNS AND CULTURAL PRODUCTION

Over the past quarter century, policy discourse in advanced capitalist countries has increasingly focused on the economic needs associated with the production of knowledge. Unlike the tangible assets linked to the industrial economy—land, labor, capital, and raw materials, the knowledge economy is largely defined by abstract goods such as research, creativity, design, innovation, and learning. For theorists like Alvin Toffler (1990) and Peter Drucker (1993), the knowledge economy represents a socioeconomic shift from labour-intensive “smokestack industries” to “mind work”.

Impacting the global economy in varied ways, knowledge and innovation are becoming central to commercial production. From network-driven business services and automated production systems, to complex engineering and just-in-time manufacturing, the knowledge economy is characterized as a new mode of capitalist production (Castells 1996; Womack et al., 1991). This is not to say that industrial manufacturing is disappearing (as if that were possible), but that technology and innovation are becoming the dominant forces of economic growth. Put differently, while Fordist manufacturing is maintained as a necessary component of production, it no longer serves as the economic engine.
Much as the assembly line shifted the critical factor of production from labor to capital, today the computer is shifting the critical factor of production from capital to innovation. Underlying this socioeconomic restructuring is the emerging importance of information and communications networks (ICNs). Beyond the command-and-control production systems characteristic of Fordist production, networks have become infrastructural to global systems of production. As Manuel Castells (2004) observes,

Networked organisations [now] outcompete all other forms of organisation, particularly the vertical, rigid, command-and-control bureaucracies… Companies that do not or cannot follow this logic are outperformed and ultimately phased out by leaner, more flexible competitors. (p. 222)

Along with changes in the management of production, information networks are giving rise to new modes of socioeconomic collaboration. Moving beyond the simple “one-to-many” linear model of industrial manufacturing, ICNs are making possible “many-to-many” production. In his book *The Wealth of Networks* (2006), Yochai Benkler describes this new economic model as “commons-based peer production”. Highlighting a wide range of examples including Wikipedia and open source software (OSS), Benkler suggests that information networks have enabled a third mode of production—beyond both the state and capital market. For Benkler, the key to understanding this emergent socioeconomic practice is the capacity of distributed networks to facilitate open source innovation. Put in the simplest terms, open source innovation is the organization of complex production through the coordination of self-organizing social networks. While traditional systems of production leverage closed proprietary systems, commons-based production utilizes open networks as platforms to harness the creative energy of volunteer contributors. Wikipedia, for example, now has more than 2.5 million articles in several languages and has become the largest encyclopedia in the world.

While peer production may depend upon the technological capacity of networks, it is ultimately configured by an emergent socio-political structure grounded in peer-to-peer (P2P) collaboration. What makes P2P so different from other modes of production is that it doesn’t rely on monetary incentives or fixed hierarchical organization. No single entity “owns” the product or manages its direction. In peer projects like social networking and OSS, for example, resources are contributed spontaneously. Political authority is “organic”, emerging and receding with the domain-based expertise needed to complete specific tasks. In these democratic “production ecologies”, authority does not disappear, but neither does it cohere in permanent socio-political hierarchies. P2P collaboration is literally production that is dependent upon the voluntary participation of partners (Bauwens, 2005).

PROSUMER INNOVATION AND P2P COLLABORATION

In their book *Wikinomics* (2006), Don Tapscott and Anthony Williams explore the potential of peer production for advancing business enterprise. As they observe, the
emerging consensus is that business models that are based on mass production are slowly being eclipsed by new models based on mass collaboration:

Throughout history corporations have organized themselves according to strict hierarchical lines of authority. Everyone was a subordinate to someone else—employees versus managers, marketers versus customers, producers versus supply chain subcontractors, companies versus the community. There was always someone or some company in charge, controlling things, at the “top” of the food chain. While hierarchies are not vanishing, profound changes in the nature of technology, demographics, and the global economy are giving rise to powerful new models of production based on community, collaboration, and self-organization rather than on hierarchy and control. (p. 1)

Tapscott and Williams make a compelling case for prosumer innovation as a significant new business strategy. Originally coined by Alvin Toffler (1980), prosumer innovation blurs the boundaries between consumers and producers, joining both categories to broader socioeconomic networks of creative collaboration. According to Tapscott and Williams, mass collaboration is a direct consequence of networks as platforms for innovation. Using examples ranging from software, music, publishing, and pharmaceuticals, Tapscott and Williams link P2P-driven web services like MySpace, InnoCentive, flickr, Second Life and YouTube to the rising power of prosumer-driven innovation. In the online virtual world Second Life, for example, prosumers form broad user-communities that create rich value-added products and services that are not possible within traditional business models.

Open business models like Second Life invite customers to add value by offering a platform for creativity. Tapscott and Williams point out that technologies like Apple’s iPod and Sony’s PSP are now routinely “hacked” to enable creative changes in their design and performance: “Whether it’s modifying the casing, installing custom software, or…doubling the memory, users are transforming the ubiquitous music and media player[s] into something unique” (p. 133).

The rising influence of prosumer hacking is the result of a convergence of P2P networks and user-friendly editing tools. While consumers with the skills and inclination to hack commercial products like the iPod remain a minority, they are a growing consumer demographic. Rather than fighting this rising tide, Tapscott and Williams argue that companies should begin to harness these changes by bringing customers into their business webs and giving them lead roles in next-generation products and services:

Forget about static, immovable products. If your customers are going to treat products as platforms anyway, then you may as well be ahead of the game. Make your products modular, reconfigurable, and editable. Set the context for customer innovation and collaboration. Provide venues. Build user-friendly customer tool kits. Supply the raw materials that customers need to add value to your product. Make it easy to remix and share. We call this designing for prosumption. (p. 148)
As they point out, it may be true that prosumer hacking forces a company to risk losing control of its product platform, but it is also true that “a company that fights its users risks soiling its reputation by shutting out potentially valuable sources of innovation” (pp. 135–6). As Tapscott and Williams observe, prosumer innovation works because it leverages self-organization as a mode of production. In their view, business leaders that want to tap this creative potential must begin to understand the needs and interests of this new market.

DEMOCRATIC INNOVATION AND DESIGN

In his book *Democratizing Innovation* (2005) Eric Von Hippel adds another critical layer to understanding prosumer innovation. Exploring the democratization of innovation in the context of design, Von Hippel argues that user-centered innovation represents the next mode of design-based manufacturing. He writes,

> When I say that innovation is becoming democratized, I mean that users of products and services—both firms and individual consumers—are increasingly able to innovate for themselves. User-centered innovation processes offer great advantages over manufacturer centric innovation development systems that have been the mainstay of commerce for hundreds of years. Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents. Moreover, individual users do not have to develop everything they need on their own: they can benefit from innovations developed and freely shared by others. (p. 1)

While traditional interpretations of innovation are focused on manufacturers as lead designers for mass consumption, Von Hippel argues that “a growing body of empirical work shows that users are [becoming] the first to develop many and perhaps most new industrial and consumer products”. Using examples from wide-ranging industries including sports equipment, software development and food services, Von Hippel argues that the contribution of product users to design is growing steadily larger as a result of emerging technologies:

> It is becoming progressively easier for many users to get precisely what they want by designing it for themselves. And innovation by users appears to increase social welfare. At the same time, the ongoing shift of product-development activities from manufacturers to users is painful and difficult for many manufacturers. Open, distributed innovation is “attacking” a major structure of the social division of labor. Many firms and industries must make fundamental changes to long-held business models in order to adapt. (pp. 2–3)

As Von Hippel observes, one major difference between users and manufacturers is context: While manufacturers largely rely on iterative improvements to well-established product designs, user-innovators tend to develop novel designs better suited to their unique environments. In turn, this practice of situated creativity is augmented further by the fact that prosumer-innovators often “freely reveal” their designs. As he explains, in order to leverage their creative efforts, prosumers
often rely on open collaboration and shared invention. Spontaneously forming communities-of-practice (Wenger, 1998), prosumer-innovators share information in order to continually distribute the creative load. As Von Hippel elaborates, this has become increasingly easier with the affordances of ICNs:

User’s ability to innovate is improving radically and rapidly as a result of the steadily improving quality of computer software and hardware, improved access to easy-to-use tools and components for innovation, and access to a steadily richer innovation commons. Today user firms and individual hobbyists have access to sophisticated programming tools for software and sophisticated CAD design tools for hardware and electronics. These information-based tools can be run on a personal computer, and they are rapidly coming down in price. As a consequence, innovation by users will continue to grow even if the degree of heterogeneity of need and willingness to invest in obtaining a precisely right product remains constant. (p. 13)

Since manufacturing firms still have advantages of scale over distributed clusters of heterogeneous user-innovators, Von Hippel advises commercial firms to develop tool-kits to allow prosumers to design and customize products and components. As he points out, this is already the case in many industries. In the semiconductor industry for example, billions of dollars worth of semiconductors are designed and produced using user tool-kits every year (p. 16). Neither is it new for user-hobbyists to have specialized tools for “amateur” work in areas such as home improvement, carpentry or software development. What is new however, is the direct linking of manufacturers to users so that custom designs can ultimately be manufactured “as is”.

The use of tool-kits and the consequent democratization of innovation, reflects a larger capacity emerging with ICNs in the knowledge economy, a capacity that will very likely transform contemporary modes of education and learning.

PROSUMER INNOVATION AND EDUCATION

But what precisely is the role of institutional education in era increasingly dominated by technologies that support democratic collaboration? In their article “Minds on Fire” (2008), John Seely Brown and Richard Adler attempt to answer this very question by considering the educational potential of social networks. Just as peer communities are transforming the production of software, Brown and Adler speculate that social learning communities will transform the production of education. As they observe, the Internet and related network technologies are enabling a revolution in social learning that is interdependent with highly distributed communities-of-practice. Unlike the traditional Cartesian approach centered on the individual learner, social learning networks depend upon highly developed forms of community apprenticeship:

In a traditional Cartesian educational system, students may spend years learning about a subject; only after amassing sufficient (explicit) knowledge are they expected to start acquiring the (tacit) knowledge or practice of how
to be an active practitioner/professional in a field. But viewing learning as the process of joining a community of practice reverses this pattern and allows new students to engage in “learning to be” even as they are mastering the content of a field. This encourages the practice of what John Dewey called “productive inquiry”—that is, the process of seeking the knowledge when it is needed in order to carry out a particular situated task. (p. 20)

Brown and Adler connect this communities-of-practice approach to a larger shift in institutional education itself. Just as prosumers are collaborating across distributed networks to create dynamic products and services, they contend that the future of education lies in opening up the design and development of courseware and curriculum to peer production. As they observe,

We need to construct shared, distributed, reflective practicums in which experiences are collected, vetted, clustered, commented on, and tried out in new contexts. One might call this “learning about learning,” a bootstrapping operation in which educators, along with students, are learning among and between themselves. (p. 28)

For Brown and Adler, this is education as “passion-based” learning in which students become apprentices in self-organizing social networks. Underlying this communities-of-practice model is a resource-driven understanding of education in which the World Wide Web represents a rich storehouse of tools and resources for ongoing cultural innovation. This knowledge commons includes open courseware and access to powerful simulation models, as well as open access to scholarly websites and journals. They write:

This new form of learning begins with the knowledge and practices acquired in school but is equally suited for continuous, lifelong learning that extends beyond formal schooling. Indeed, such an environment might encourage students to readily and happily pick up new knowledge and skills as the world shifts beneath them. (p. 32)

**CONNEXTIONS: DEMOCRATIZING THE KNOWLEDGE COMMONS**

One clear example of what Brown and Adler are exploring is the Connexions project at Rice University. Launched in 1999, Connexions is a cross-disciplinary knowledge commons that fosters the ongoing construction of tools and resources for all levels of education (Connexions White Paper, 2004). Inspired by the tremendous growth of open-source software, Connexions is designed to offer students and educators access to modular resources from around the world. Authors contributing to Connexions retain copyright on all resources but make them freely available under a Creative Commons license.

As a resource repository, Connexions is constructed as a globally-distributed environment that transcends the exclusivity of classroom knowledge transmission. While knowledge is traditionally transmitted to students in highly formalized stages, Connexions offers students the possibility to access the knowledge
continuum in its entirety. Using a P2P architecture, Connexions operates as a single, nonlinear network that can enable students and researchers to enter into the knowledge continuum from any point of interest. Most importantly, by giving anyone access to the entire continuum, Connexions encourages students and teachers to perceive the “big picture” of knowledge in a holistic way:

The traditional method of transmitting this information—textbook publishing—is inefficient. In contrast to the rate at which the knowledge continuum changes, it is a glacial process. The dynamics of the system are lost; students receive what is essentially a still photograph of the continuum at a given point in time. Textbook authors must devote several years to writing their books, and then their work is subject to editorial review. Finally their books enter the printing and marketing cycle. This is a substantial time commitment for college professors. Thus, textbooks are, almost by definition, stale even at the date of their publication. Knowledge that is evolving at a rapid pace, such as in computer science, environmental science, bioinformatics, and medicine, can never be captured by this traditional delivery method. (Connexions 2004, p. 3)

Designed around an open-content license, Connexions supports a globally inclusive authoring environment for teachers, researchers and students. Authors can build on and advance anything in the Content Commons. While educational modules are encoded in a single language (XML), modules can be translated into a number of media formats including HTML, PostScript, PDF, Microsoft Word and PowerPoint. Moreover, modular units stored in the Commons can be combined and used in an infinite variety of courseware packages.

The collaborative nature of Connexions fuses participatory feedback to iterative improvement in the ongoing expansion of the repository. In this way, Connexions facilitates self-organizing prosumer improvement without limiting access. Using visualization and navigational tools, curriculum developers can continually mine a rich repository of highly scalable resources. In turn, using post-publication editorial and review, specialists can utilize independent standards to harvest quality materials suitable to domain specific needs. Moreover, third party editorial boards can employ independent lenses to filter and manage the raw resources as needed.

Available free of charge to anyone under an open-content license, Connexions aims to enable a large-scale repository for global learning communities. While the Content Commons repository remains technologically centralized, the goal of Connexions is to grow its’ infrastructure along with its reach in order to enable a truly globally-distributed P2P ecosystem. Deliberately designed to support global collaboration, Connexions is a concrete example of a distributed network supporting prosumer communities. In this regard, Connexions represents a strong model of the tremendous scalability of collaborative networks to facilitate user-driven learning. More to the point, as a knowledge commons, Connexions offers a comprehensive framework for considering the development of educational tools and resources for democratic innovation.
Fundamental to this democratic shift is an emerging understanding that networks offer a robust platform for shared collaboration and learning-by-doing. To understand the underlying dynamism of network production, however, we must begin by exploring complex living systems.

The concept of the network was developed in the 1920s to describe communities of organisms linked through food webs and its use then became extended to all systems levels: cells as networks of molecules; organisms as networks of cells; ecosystems as networks of individual organisms (Capra, 1996; Barabasi, 2002). The network pattern is one of the very basic patterns of organization of all living systems whose key characteristic is self-generation—the continual production, reproduction, repair and regeneration of the network.

Unlike machines, living systems have no controlling parts or levels. While biologists once viewed natural systems in mechanistic terms, many scientists now study living systems in terms of complex networks. Since living organisms rely on an interdependence of “communication” between component parts, they are not easily reduced to hierarchies of command-and-control. As the parts of an organism adjust and respond to the changes required for maintenance, the whole is preserved as an integral unit. Ervin Laszlo (2001) explains it this way,

The concept “the whole is more than the sum of its parts” holds, for when the parts are integrated within the living organism, properties emerge and processes take place that are not the simple sum of the properties or aggregate of the processes of the parts. The living organism cannot be reduced to the interaction of its parts without losing its “emergent properties”—the very characteristics that make it living. (p. 180)

One major key to understanding natural systems is their capacity for “autopoiesis” or self-production (Varela and Maturana 1974). Systems in nature are not constrained by entropy but function as “open systems”, capable of exchanging matter and energy with their environment. In the context of natural science, an open system is any system with borders that are permeable to both energy and mass. Where closed systems contain limited energy and are vulnerable to entropy, open systems can tap a potentially infinite supply of energy from the surrounding environment. By “importing” energy across permeable boundaries, open systems absorb the resources necessary for self-creation. It is this capacity for “bottom-up” self-organization that enables living systems to evolve. As we are coming to understand, it is this very capacity that helps explain contemporary changes in economic production as well.

By importing volunteer labor across organizational boundaries, prosumer innovation systems are not constrained by cultural entropy but are continually replenished. Put differently, it is precisely the open structure of peer systems that stokes continuous innovation.
PEER PRODUCTION: FROM HIERARCHY TO HETERARCHY

As an emergent mode of production, peer production not only “flattens” the organizational pyramid it creates an ecology-of-exchange without recourse to higher authority at all. Ironically, it is this very quality that makes prosumer innovation so attractive to commercial organizations. Internet companies like Amazon and Ebay, for example, have produced compelling business models by directly integrating prosumer participation into their service structures.

Peer networks represent an emergent mode of human socio-political organization highly conducive to creativity and innovation. P2P networks such as the World Wide Web, for example, capitalize on “heterarchical” systems of organization. Unlike the top-down structures that are critical to industrial production, heterarchical systems depend upon the isomorphic structure of networks. While definitions of the word heterarchy vary, heterarchical structures are generally defined as networks of elements that share the same “horizontal” position of power and authority. In P2P computer networks, for example, an infinite density of point-to-point connections enable any computer node to connect to any other without the need for mediation (the Internet being the most obvious example of this).

Over the course of history, hierarchical organization has been a central technology for managing economic, social and political development. Loosely defined, a hierarchy is a vertical system of ranking and organizing in which each component element is subordinate to another in a descending ladder or pyramid. The fact that hierarchies have been the central medium for managing human affairs throughout most of human history is testament to their utility. Today, however, as the center of production shifts away from management and towards creativity and innovation, the value of hierarchical organization is now in doubt:

Throughout most of human history, hierarchies of one form or another have served as the primary engines of wealth creation and provided a model for institutions such as the church, the military, and government. So pervasive and enduring has the hierarchical mode of organization been that most people assume that there are no viable alternatives. Whether the ancient slave empires of Greece, Rome, China, and the Americas, the feudal kingdoms that later covered the planet, or the capitalist corporation, hierarchies have organized people into layers of superiors and subordinates to fulfill both public and private objectives. Even the management literature today that advocates empowerment, teams and enlightened management techniques takes as a basic premise the command modus operandi inherent in the modern corporation. Though it is unlikely that hierarchies will disappear in the foreseeable future, a new form of horizontal organization is emerging that rivals the hierarchical firm in its capacity to create information-based products and services, and in some cases, physical things. (Tapscott and Williams, p. 23)
COLLECTIVE INTELLIGENCE AND PROSUMER INNOVATION

The Internet represents a global sociotechnological platform in which the knowledge, resources, and computing power of billions of people are increasingly coming together into a massive collective force:

Energized through blogs, wikis, chat rooms, personal broadcasting, and other forms of peer-to-peer creation and communication, this utterly decentralized and amorphous force increasingly self-organizes to provide its own news, entertainment, and services. As these effects permeate out through the economy and intersect with deep structural changes like globalization, we will witness the rise of an entirely new kind of economy where firms coexist with millions of autonomous producers who connect and cocreate value in loosely coupled networks. (Tapscott and Williams, p. 32)

Perhaps one of the most ambitious attempts to consider the implications of mass collaboration is Pierre Lévy’s (1997) work in “collective intelligence”. For Lévy, collective intelligence underlies a new paradigm that is emerging in various fields of research simultaneously,

Far from being exclusive, the expression “collective intelligence” relates to an extensive body of knowledge and thoughts concerned with several objects that have been diversely labeled: distributed cognition, distributed knowledge systems, global brain, super-brain, global mind, group mind, ecology of mind, hive mind, learning organization, connected intelligence, networked intelligence, augmented intelligence, hyper-cortex, symbiotic man, etc. Notwithstanding their diversity, these several rich philosophical and scientific contemporary trends have one feature in common: they describe human communities, organizations and cultures exhibiting “mind-like” properties…

Lévy argues that a global civilization built around collective cultural production is emerging around ICNs. Beyond the fading superstructure of mass industrial society, Lévy believes that ICNs are giving birth to an age of shared cultural production. As he suggests,

Those who manufacture things will become scarcer and scarcer, and their labour will become mechanized, augmented, automated to a greater and greater extent. Information processing skills will no longer be needed, for intelligent networks will soon be able to function with little human assistance. The final frontier will be the human itself, that which can’t be automated: the creation of sensible worlds, invention, relation, the continuous creation of the community. (Lévy, 1997, p. 34)

The challenges of this new era are becoming obvious. The rapid evolution of technology has begun to displace the traditional social bonds of virtually every community in the world. Lévy argues that the urgent need for social cohesion will spawn the foundations for an economy increasingly built on a shared global culture. As the global economy progressively moves beyond goods and services,
issues of ethics and shared human development become critical. Success in this cultural economy argues Lévy, is becoming contingent on a collaborative and evolving consciousness. He explains,

A vast political and cultural plain stands before us. We have an opportunity to experience one of those rare moments when a civilization deliberately invents itself. But this opportunity won’t last for long. Before blindly stumbling into a future from which we cannot return, it is essential that we begin to imagine, experiment with, and actively promote, within this new [informational] space, organizational structures and decision-making styles that are oriented toward a deepening of our sense of democracy. Cyberspace could become the most perfectly integrated medium within a community for problem analysis, group discussion, the development of an awareness of complex processes, collective decision-making, and evaluation. (p. 59)

Information technology represents a quantum jump in cognitive evolution. With the emergence of ICNs, the work of cultural construction is increasingly being supported by platforms that scaffold creative collaboration. For thinkers like Lévy, the World Wide Web represents the emergence of a semantic commons that is gradually enabling the whole of humanity to house and manage its cultural heritage. This is significant because it means that much of the world’s knowledge may one day be available to be seen, explored and advanced by people throughout the world. Lévy describes this emerging democratic knowledge space as a virtual cosmopedia:

Not only does the cosmopedia make available to the collective intellect all of the pertinent knowledge available to it at any given moment, but it also serves as a site of collective discussion, negotiation, and development. A pluralistic image of knowledge, the cosmopedia is the mediating fabric between the collective intellect and its world, between the collective intellect and itself. Knowledge is no longer separated from the concrete realizations that give it meaning, nor from the activities and practices that engender knowledge and that knowledge modifies in turn. Depending on the zones of use and paths of exploration, hierarchies between users and designers are inverted. A person who decides to learn about a topic in biochemistry or the history of art will be capable of supplying new information about a given sector of electronics or infant care, one in which he or she happens to specialize. In the cosmopedia all reading is writing… Unanswered questions within cosmopedic space, [will indicate] regions where invention and innovation are required. (pp. 217–8)

COLLECTIVE CULTURAL COGNITION

For sociocultural theorists, human cognition is mediated by embedded cultural practices that acquire meaning in social contexts. In this sense, human cognition is largely indistinguishable from the ongoing social practices of cultures and communities. Advancing on Lev Vygotsky (1978), sociocultural researchers
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contend that the internalization of cultural artifacts such as language, writing, and numbers, form the foundations for human consciousness:

[T]here is reason to suspect that what we call cognition is in fact a complex social phenomenon. The point is not so much that arrangements of knowledge in the head correspond in a complicated way to the social world outside the head, but that they are socially organized in such a fashion as to be indivisible. ‘Cognition’ observed in everyday practice is distributed – stretched over, not divided among – mind, body, activity and culturally organized settings. (Lave, 1988, p. 1)

For sociocultural theorists, whole systems of artifacts (words and numbers) form the basic foundations for shared cultural cognition. For this reason, the construction of new cultural resources is highly dependent upon the mediated collaboration and evolution of cognitive tools. Just as new tools of labor facilitate new social structures, new tools of thinking facilitate new cognitive structures. This artifact-mediated understanding of human culture and consciousness is even more obvious today. With the emergence of worldwide ICNs, the process of knowledge construction is becoming highly dependent upon distributed communities-of-practice.

DEMOCRACY AND EDUCATION IN A KNOWLEDGE AGE

It is becoming clear that the application of ICNs to systems of knowledge and learning will be anchored to collaborative innovation. ICNs make possible a multimodal approach to learning systems that increasingly provides users with more and greater control over their own learning. As Lévy points out, this reflects an emergent global process grounded in collective intelligence. What is perhaps most fundamental to this new mode of production, however, is its’ capacity to support prosumer innovation. This will very likely have revolutionary implications for institutional education. For this reason, it is critical that educators and educational policy makers begin to explore the possibilities and challenges of students as prosumer-innovators.

At the same time, the significant economic, technological and social changes emerging within a knowledge economy require that formal education redefine its’ underlying assumptions. For educationalists like Bereiter (2002) and Scardamalia (2002), education in a knowledge economy is inherently linked to the capacity of all students to advance knowledge and ideas. They suggest that the health and wealth of societies depends increasingly on leveraging creativity. For this reason, Bereiter and Scardamalia suggest that the creative construction of new theories and ideas is the key to reshaping education. While traditionally, education systems have been constructed to support cultural reproduction, they have not given students the experience of independent idea improvement. As Bereiter and Scardamalia point out, people in general and not just a specialized elite need to be able to work creatively in the production of knowledge. What this means is that students of all ages must be directly engaged in the creation process.
As Bereiter and Scardamalia observe, the key to unlocking this potential is developing education as “knowledge building”. This means fostering democratic communities around a shared knowledge commons. By connecting specialized communities to a shared environment, knowledge building can potentially enable cross-pollination and continuous idea improvement. As they point out, it is not enough to simply require students to master the component skills of knowledge creation: critical thinking, the scientific method, etc. The technological, social and ethical needs of a rapidly globalizing society will require people that can creatively construct and evolve new tools, ideas and practices. While pedagogy for mass education largely aimed at student mastery of established knowledge, education in a knowledge economy must work to scaffold creativity itself. Through the process of building knowledge collaboratively, students can achieve epistemic agency— that is, share in a cooperative effort for making knowledge innovation successful and of benefit to all.

As Bereiter and Scardamalia point out, a conservative bias within the structure of mass education has reduced knowledge creation to an elite few. The fact that it is only at the graduate level that students are actively encouraged to create knowledge is now becoming a significant problem. If knowledge innovation is to genuinely constitute the foundations of a knowledge economy, then public education must begin to move beyond social reproduction. This represents a challenge for institutional education but projects like Connexions demonstrate that a transformation in education is very likely already under way.

CONCLUSION

This chapter has explored the contours of prosumer innovation and its emerging potential for advancing social and economic production in the knowledge economy. Building out from new technologies, prosumer innovation is anchored to open systems and open networks of mass collaboration. Looking at prosumer innovation from the perspective of complex networks, I have considered the implications of this emerging cultural practice for systems of education. Focusing on collective intelligence and the democratization of knowledge creation, I have argued that prosumer innovation should now be a central area of exploration for theorists and practitioners in the field of educational policy.

REFERENCES

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