OPEN EDUCATION

The Pedagogy of the Open Society

Knowledge and the Governance of Higher Education

Michael A. Peters, Tze-Chang Liu
and David J. Ondercin

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Open Education
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Scope
"Open education involves a commitment to openness and is therefore inevitably a political and social project. The concept of openness in regard to education pre-dates 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. 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." http://www.ffst.hr/ENCYCLOPAEDIA/doku.php?id=open_education_and_education_for_openness

This new series is devoted to the general theory and practice of open education in all its forms.

The Pedagogy of the Open Society

Knowledge and the Governance of Higher Education

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RADICAL OPENNESS: A POLITICAL THEORY OF SOCIAL INSTITUTIONS

> Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction.
>
> –Douglass C. North (1990) *Institutions, Institutional Change and Economic Performance*, p. 3

> This was our paradox: no course of action could be determined by a rule, because every course of action can be made out to accord with the rule. the answer was: if everything can be made out to accord with the rule, then it can also be made out to conflict with it. and so there would be neither accord nor conflict here.
>
> It can be seen that there is a misunderstanding here from the mere fact that in the course of our argument we give one interpretation after another; as if each one contented us at least for a moment, until we thought of yet another standing behind it. What this shews is that there is a ways of grasping a rule which is *not* an *interpretation*, but which is exhibited in what we call "obeying the rule" and "going against it" in actual cases.
>
> –Ludwig Wittgenstein, (1953) *Philosophical Investigations*, §201

INTRODUCTION

Openness is a complex code word that represents a change of philosophy and ethos, a set of interrelated and complex changes that transforms markets, the mode of production and consumption, ushering in a new collection of values based on *openness*, the ethic of participation and peer-to-peer collaboration. These changes indicate a broader shift from an underlying metaphysics of production—a 'productionist' metaphysics—to a metaphysics of consumption as use, reuse and modification with new logics and different patterns of cultural consumption in the areas of new media where symbolic analysis becomes a habitual and daily creative activity. The new language of 'prosuming' and 'produsage' is an attempt to capture open participation, communal evaluation, fluid heterarchy and equipotentiality, common property with individual rewards (Bruns, 2008). 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.

Social processes and policies that foster *openness* as an overriding value as evidenced in the growth of open source, open access and open education and their

convergences that characterize global knowledge communities that transcend borders of the nation-state. Openness seems also to suggest political transparency and the norms of open inquiry, indeed, even democracy itself as both the basis of the logic of inquiry and the dissemination of its results.

These changes and insights have been the basis for a series of major reports by the U.S. Committee for Economic Development with its most recent report on Open Standards, Open Source, and Open Innovation: Harnessing the Benefits of Openness (Maxwell, April 2006) that focuses on new collaborative models of 'open innovation,' originating outside the firm, that results in an 'architecture of participation.' Three major reports were published in the last few years: Giving Knowledge for Free: The Emergence Of Open Educational Resources (OECD, 2007); Open Educational Practices and Resources (OLCOS, 2007); A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities (Atkins, Brown, & Hammond, 2007). As the OECD report puts it:

> 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) (OECD, 2007, p. 9).

Openness in education has a history that comprises a set of interrelated movements: The Open Classroom; Open Schooling; The Open University (UK); Open Courseware; Open Educational Resources (OER); Open Education. MIT OpenCourseWare has reached 35 million people and another 14 million in translation. The OpenCourseWare Consortium '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.'

Open Education embodies three main aspects: openness of learning content (full courses, courseware, journals); tools for openness (software to support the development, use, reuse and delivery of learning content and management systems); implementation of openness (through IP licences to promote open publishing and design principles of best practice with localized content) (OECD, 2007). The Ithaka Report, *University Publishing In A Digital Age* (Brown, Griffiths, Rascoff, 2007) focuses on:

- *changes in creation, production and consumption of scholarly resources* – '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), and,
- *'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)

The recent Cape Town Open Education Declaration indicated that we are on the cusp of a global revolution in teaching and learning where educators worldwide are developing a vast pool of educational resources on the Internet, open and free for

all to use.[1] *Open Education* 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 (see Peters & Britez, 2008).

In *The Wealth of Networks: How Social Production Transforms Markets and Freedom* Benkler (2006) develops a vision of the good society based on access and distribution of information goods in a networked global information economy that places a high value on individual autonomy where within the public information space of the Internet and the information commons people have the individual means to pursue their own interests. The emergence of the global networked information economy made possible by increasingly cheaper processors linked as a pervasive network has created an information economy based on the production of information and culture that enables social and nonmarket or peer-to peer production and exchange to play a, perhaps even, the central role. Benkler's (2006) *The Wealth of Networks* links to a broader tradition of thought who have attempted to retheorize the public domain such as Jane Jacobs, James Scott, Richard Sennett and Iris Marion Young.

Openness is a value and philosophy that also offers us a means for transforming our institutions. Institutions are humanly devised; they set constraints and shape incentives. For example, economic institutions such as property rights, or contract shape economic incentives, contracting possibilities and distribution. Political institutions, including form of government, separation of powers and so on shape political incentives and distribution of political power. There is an important distinction to be made between formal institutions based on codified rules—such as a constitution—and informal institutions related to the question of the distribution of power, social norms, and equilibrium. Sociologists use the term 'institutions' to refer to complex social forms – including governments, the family, human languages, universities, hospitals, business corporations, and legal systems—that comprise

> a complex of positions, roles, norms and values lodged in particular types of social structures and organising relatively stable patterns of human activity with respect to fundamental problems in producing life-sustaining resources, in reproducing individuals, and in sustaining viable societal structures within a given environment, (Turner 1997: 6).

Clearly, "social institutions need to be distinguished from less complex social forms such as conventions, rules, social norms, roles and rituals" which "are among the constitutive elements of institutions" and from "more complex and more complete social entities, such as societies or cultures, of which any given institution is typically a constitutive element" (Miller, 2011). As Semus Miller (2011) goes on to argue "Social institutions are often organisations," and sometimes *systems* of organisations, and *meta-institutions* that organise other institutions—"thus governments regulate and coordinate economic systems, educational institutions, police and military organisations and so on largely by way of (enforceable) legislation."

He proceeds to give an account of social institutions within the scope of liberal democracy based on Rawls' (1972, 1999) account of distributive justice. It is perhaps surprising that he draws the distinction between economic and social institutions so exclusively. In the social sciences two broad types of institutions are advanced, both essentially political, although they exhibit different variations. The first that is the characteristic approach of neoclassical economics focuses on the behavior of the rational individual agent (so-called "rational utility maximisers") and treats all macrostates as simply the outcomes of interactions among individuals. The traditional ruling assumptions of this approach are associated with the revival of *homo economicus* based on individuality, rationality, and self-interest.

The alternative approach starts with social structures embedded in a historical context and views the individual as a reflection of or bearer of structures. In economic theory, this is a "agentless" view that emphasizes the governing effects of larger structures such as "culture," "society," and "economic system" that are comprised of organization and institutions. This kind of theory is characteristic of Marxian, radical, and institutionalist theories.

THE REASSERTION OF INSTITUTIONAL THEORIES

By the end of 1990s commentators were heralding the end of public choice and new public management with a resurgence of institutional theories based on March and Olsen (1984) famous paper. B. Guy Peters (2000: p. 1) writes:

> The past decade and a half have seen a major reassertion of institutional theories in the social sciences, and especially in political science. The March and Olsen (1984) article in the APSR was the beginning of the revolution against the methodological individualism of both behavioralism and rational choice approaches. Following from that and their subsequent publications (1989; 1994; Brunsson and Olsen, 1993; Olsen and Peters, 1996) there has been a proliferation of institutional theories and applications of those theories. Similarly, in economics (North, 1990; Alston, Eggerston and North, 1996; Khalil, 1995) and in sociology (DiMaggio and Powell, 1991; Scott, 1995; Zucker, 1987) there has been a birth (or more appropriately a resurrection) of institutional approaches to the basic questions in these disciplines.

Douglass North (1991: 97) is a stunning example of an economic approach to institutional theory that focuses on his earlier work relating to economic and institutional change. He writes

> Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity. They

> evolve incrementally, connecting the past with the present and the future; history in consequence is largely a story of institutional evolution in which the historical performance of economies can only be understood as a part of a sequential story. Institutions provide the incentive structure of an economy; as that structure evolves, it shapes the direction of economic change towards growth, stagnation, or decline.
>
> Constraints, as North describes, are devised as formal rules (constitutions, laws, property rights) and informal restraints (sanctions, taboos, customs, traditions, code of conduct), which usually contribute to the perpetuation of order and safety within a market or society. The degree to which they are effective is subject to varying circumstances, such as a government's limited coercive force, a lack of organized state, or the presence of strong religious precept.

In 1997 he helped found the International Society for the New Institutional Economics that attempts to extend economics by focusing on the social and legal norms and rules that underlie economic activity. In the 1960s and after the rise of rational and public choice theories accompanied a revival of neoclassical economics based on *homo economicus* especially by the third generation Chicago school including Milton Friedman, Gary Becker and a number of other Nobel prize winners which swept everything before it and systematically replaced Keynesianism as the ruling orthodoxy (see Chapter 7).

While the economic theorists have been developing the new institutionalism governed by economic norms and principles applied the opeartions of social institutions, other social and political theorist have systematically critiqued the nature of closed institutions on the grounds that closed institutions typical of industrial modernity tend to be very manipulative and controlling.

DISCIPLINARY SOCIETIES, MANIPULATIVE INSTITUTIONS: FOUCAULT, ILLICH AND THE CRITIQUE OF WESTERN MODERNITY

There are broad similarities between the oeuvres of Michel Foucault and Ivan Illich and a set of overlapping interests even if there are differences in background, personal histories and philosophical approaches. These similarities and differences are useful points of reference as the similarities endorse one another and set up a deeper critique of the institutions of Western modernity than would be otherwise possible. Both Illich and Foucault were bought up as Catholics and develop a sense of history strongly featuring the influence of Christianity and the Church's shaping of institutions and subjectivities, even although their methods differ. Both employ broad historical approaches to the critique of Western modernity and its institutions and both take cybernetics as the starting point for a theory of institutions within a new type of emerging postmodern society characterized by closely articulated and interrelated systems.

One of the strongest parallels and sources of motivation for the work and for the similarities between them springs from the set of arguments associated with the anti-psychiatry movement that took root in the 1960s and '70s and developed as a fully fledged philosophy of deinstitutionalization guiding the process of reform of

the large asylums. For Foucault, the analysis was in part an analysis of the history of subjectivity, of subject populations, in the early modern era. He was interested in marginalized groups and the forms of institutional enclosure of the prison, the school, and the clinic, and the production of "docile bodies". Foucault (1977; 1980) analyzed and described the process of institutional incarceration and its power/knowledge effects—the emergence of new discourses based on the gaze and surveillance of institutionalizaed individuals. For Illich, motivated by similar questions concerning freedom and its institutionalized forms, focuses on questions concerning the debilitating psychological and political effects of processes of institutionalization that he investigates in relation to what he calls "manipulative institutions" as opposed to what he calls "convivial institutions" that are characterized by spontaneous use. Illich also generalizes his critique to a critique of Western institutions aimed at growth and based on processes of consumption. He investigates a variety of different institutions, most famously the school, but also the hospital, and "disabling professions" associated with those institutions that have a compassionate image but paradoxically only produced more people who are psychologically dependent and have been robbed of the intellectual vitality. Illich, strongly influenced by his Jesuit past, worked with cultural minorities and understood that institutionalization was also one of the dominant processes of Western colonization.

There is nothing in the literature that compares these two important thinkers. We would encourage our readers to explore the parallels in their thinking in order to develop, strengthen and broaden their critique of Western modernity through the critique of institutions. What are the different forms of analysis that Illich and Foucault bring to bear on Western institutions, their subjectivity effects, their relationship to forms of governance, and a philosophy of deinstitutionalization? The experience of deinstitutionalization is a philosophy with a very complex policy history. Illich and Foucault are very important in the movement of anti-psychiatry that aims at altering the set of power relations within large asylums and institutions for mentally ill through the processes of deinstitutionalization. Both Illich and Foucault discuss forms of deinstitutionalization. Illich's move to "convivial institutions" is a philosophical basis for the improvement in the design of Western institutions and is remarkably foresightful in understanding the politics of the open institution based on the user—not user-pays but user-created. Convivial institutions for Illich are based on a "radical openness". Illich (1973:57) writes

> I consider conviviality to be individual freedom realized in personal interdependence and, as such, an intrinsic ethical value. I believe that, in any society, as conviviality is reduced below a certain level, no amount of industrial productivity can effectively satisfy the needs it creates among society's members.

Convivial institutions serve 'politically interrelated individuals rather than managers' (Illich 1975: 12) and are characterized by principles of spontaneous use, voluntary participation and universal access that foster forms of association such as peer learning and governance in flat hierarchies. This is the essence of his "learning

webs" that he offers as an alternative to compulsory schooling developed some twenty years before the invention of the Internet.

Today with the advent of the Internet and new technologies of openness these principles become the basis of innovative institutional forms that use Web 2.0 and 3.0 technologies to decentralize and democratize power, access to knowledge and relationships. This book is an indication of the virtues of openness (Peters & Roberts, 2011) and its applications in education.

NOTES

[1] See http://www.capetowndeclaration.org/

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CHAPTER 1

CREATIVE ECONOMY AND OPEN EDUCATION: THE POLITICAL ECONOMY OF OPEN KNOWLEDGE PRODUCTION

Creative economy and open education seem to be two different fields but have a common emphasis on "open knowledge". Moreover, open knowledge can contribute to political economic development. This section includes discussion of open knowledge and how education promotes open knowledge. In addition, peer-to-peer (P2P) relations play an important role in open knowledge production by constructing collective networks in order to create knowledge and innovations. Open knowledge production is an important feature that has emerged from the concepts of creative economies and openness. Open knowledge can also be seen as the main factor that can be expected to promote knowledge economies in the future due to their efficiency and influence on knowledge production.

Creative economies and open education have an interactive relationship with respect to their development and social influences. Creative economies sometimes require the sort of collective knowledge production that open education can provide. On the other hand, open education can be improved with creative economic development, which encourages a culture of openness and improves communication technology. Both may also provide a broader social good by offering opportunities to greater numbers of individuals to acquire knowledge and participate in interactive knowledge creation. More to the point, broad social environments and relationships are critical for the development of open knowledge, and vice versa.

The moral implications of pedagogy also suggest that our responsibility as public intellectuals cannot be separated from the consequences of the knowledge we produce, the social relations we legitimate, and the ideologies and identities we offer to students (Giroux, 2006, p. 69). Open knowledge promotes knowledge production and a type of open culture that encourages openness. This openness can either influence individuals to open their minds and share their thoughts or encourage established interactive networks and open social boundaries.

INTERACTION BETWEEN CREATIVE ECONOMIES AND OPEN EDUCATION

Peters (2010a.) stated that the concept of open innovation helps explain the relationship between creativity and openness. Increasingly complex innovations encourage companies to obtain knowledge from external sources and utilize

nonlinear feedback (Teirlinck & Spithoven, 2008; Peters, 2010a.). As complex innovation networks grow, the use of the model of open innovation unlocks the gates for the adoption of knowledge across disciplines and across institutions, so that increasing numbers of knowledge-creating partners are welcomed (Teirlinck & Spithoven, 2008). Creativity can occur in any system that has characteristics of openness (Johnson, 2005). Open education provides opportunities for the production of open collective knowledge. These fulfill the need for open innovation and cross boundaries that exist in creative economies.

The needs of creative economies can also encourage applications of innovative communication technologies. The various aspects of creative economies are often combined with advanced technological applications in order to produce new creations. Creative economies can also encourage the improved usage of technology, including communication technologies. Open education development today refers to improvements in communication technologies. As creative economies develop, they experience an increasing need for open innovation, which leads to open education, which in turn attracts greater public interest and resources, which can improve its effectiveness.

COOPERATION FOR PERSONAL AND SOCIAL GOOD

Combining creative economies and open education can provide personal and social benefits. Encouraging creativity and openness in aspects of either creative economies or open education engenders competition for individuals and society. On one hand, individuals can use open education to obtain and create knowledge, because open education provides access to personal learning, which allows individuals to contribute to creative economies and even profit from them. On the other hand, taking a broader organizational and social perspective, greater numbers of individuals can obtain knowledge and contribute to innovations. Both creative economies and open education encourage collective knowledge, which can spur individual contributions and cooperation in the production of knowledge.

Opening learning opportunities allow individuals to obtain knowledge and can improve human resources on the societal level. Collective knowledge can lead to broader level of cooperative innovations. Richard Luecke (2003) noted that a high percentage of important inventions in organizations are produced by means of collective effort. Being open to new ideas, even in the face of scientific skepticism, is important for organizational creativity (Luecke, 2003). Creative economies and open education provide educational resources for individuals to use. They also provide organizations and societies with an environment that encourages the development of new innovations.

OPEN KNOWLEDGE IN THE PRESENT

Open knowledge on one hand identifies knowledge held openly and is available to all individuals. On the other hand, open knowledge indicates the era of collective cooperation in knowledge production processes. Knowledge is now available to greater numbers of individuals than in the past. As knowledge systems change from esoteric to open, open knowledge represents the future in academic development and democratic societies. As regards research and the academic community, knowledge is increasingly open to critiques and discussion in academic communities. The open attitude, which is characteristic of knowledge systems, encourages the creative development of knowledge. In democratic societies, open knowledge can enlighten the citizenry. Putting democratic ideals into practice requires that individuals understand public issues and become involved in discourse. Given such circumstances, citizens require a certain level of basic knowledge in order to deal with issues and deal with other people when they engage in discourse. Open knowledge can offer individuals the tools and equipment that democratic societies need. The rise of knowledge economies and creative economies has made knowledge increasingly crucial because it has become increasingly synonymous with the ability to compete economically. Peters (2010b.) explained open knowledge as follows:

> Open knowledge production is based upon an incremental, decentralized (and asynchronous), and collaborative development process that transcends the traditional proprietary market model. Commons-based peer production is based on free cooperation, not on the selling of one's labor in exchange for a wage, nor motivated primarily by profit or for the exchange value of the resulting product; it is managed through new modes of peer governance rather than traditional organization hierarchies and it is an innovative application of copyright which creates an information commons and transcends the limitations attached to both private (for-profit) and public (state-based) property forms (Peters, 2010b., pp. 257).

Open knowledge also indicates that knowledge can be shared and created by greater numbers of inclusive individuals. Knowledge serves the public good. Peters (2010b., pp. 254–255) states that knowledge has the following features that serve the global public good:

1. Knowledge is non-rivalrous
2. Knowledge is barely excludable
3. Knowledge is not transparent

Contemporary open knowledge production can be accessed using communication technologies and is supported by the ideas of openness and creative economies. Greater numbers of individuals can participate in the production of open knowledge through technologies such as the Internet. Open knowledge production does not focus exclusively on knowledge-producing outcomes. It also focuses on increasing collective intelligence as a form of input. Increasing collective intelligence requires

opening opportunities for more people to become involved, and releasing information and knowledge for more people to absorb. This relates primarily to open education, which can provide resources and opportunities for greater numbers of people and encourage them to interact and create new knowledge products.

THE GROWTH OF CIVILIZATION AND OPEN KNOWLEDGE PRODUCTION

Open knowledge production becomes more inclusive and open to all individuals in part as a byproduct of technological developments. The knowledge economy recognizes knowledge as the basis of innovations that support economic growth, and the production of knowledge has become more crucial. Open knowledge production is influenced by communication technologies and creative economies.

TECHNOLOGICAL DEVELOPMENTS

Developments in communication technologies have influenced open knowledge production by encouraging the creation of open cultures and interactive knowledge. Contemporary technological improvements have influenced industrial and social development. Improvements in information systems have changed the nature of industrial production and have impacted social cultures and network usage. Masuda (1981) stated that technological innovations have changed social economic systems in three ways:

> First, technology does the work once done by man. Second, technology makes possible work that man has been unable to do before. Third, existing social and economic structures have been transformed into new social and economic systems. (Masuda, 1981, p. 59)

Technology influences production processes, including knowledge production and the development of cyber societies. Technological development, particularly in the communication of information—that is—media and the Internet, have changed social and economic structures. O'Reilly[1] (also in Peters, 2010b, p. 253) claimed that the core competencies of Web 2.0 include:

1. Services, not packaged software, with cost-effective scalability
2. Control over unique, hard-to-recreate data sources that become richer as more people use them
3. Trusting users as co-developers
4. Harnessing collective intelligence
5. Leveraging the Long Tail ' through customer self-service
6. Software above the level of a single device
7. Lightweight user interfaces, development models, AND business models

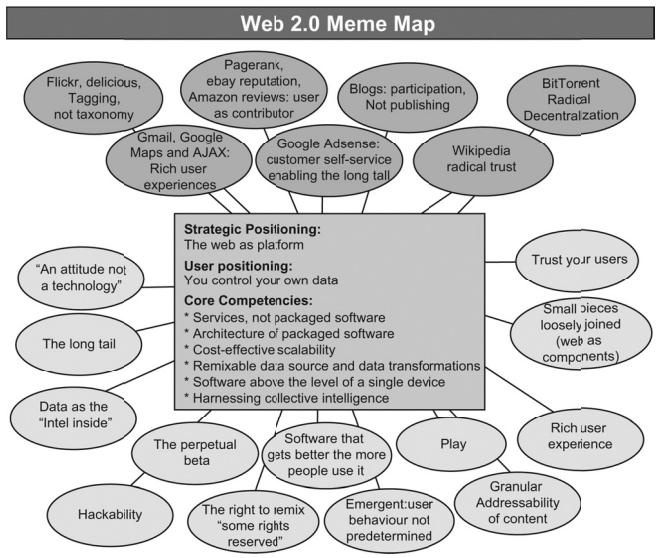

Figure 1. Web 2.0.[2]

This shows a "meme map" of Web 2.0, developed during a brainstorming session at FOO Camp, a conference held by O'Reilly Media.[3] Web 2.0 is an advanced communication technology that influences the culture and practices of open knowledge production. Web 2.0 improves the quality and efficiency of communication, creativity, information sharing, collaboration and the function of communication technology. Openness, innovation, culture, and knowledge-creating communities are phenomena that have been influenced by Web 2.0. Forms of education that make use of technology to promote openness are the result of Web 2.0 (Peters & Britez, 2008), and the open system concept in education has brought forth new possibilities. Wiki-collaboration based on the wisdom of the crowd' (Surowiecki, 2004), mass innovation (Leadbeater, 2009), and inclusive participation and collaboration all encourage the development of social media and networking (Peters, 2009). This technology improvement may enhance the development of open knowledge.

FROM CLOSED SYSTEM TO OPEN SYSTEM

Knowledge production systems include closed and open systems. On one hand, knowledge of various technologies and arts has promoted open knowledge. On the other hand, the kinds of knowledge provided by formal education have often been closed and limited to selected groups throughout recorded history. This section begins with the esoteric system, and focuses on closed educational systems that have existed in the past. The second part focuses on the perspectives of an open system, and involves technology, the development of art, and educational

openness. The third part describes changes in the knowledge system and knowledge production.

ESOTERIC SYSTEMS

Education and learning opportunities were limited to members of elites in early human history. Limited transportation in ancient times resulted in homogeneous societies in which religion played an important role. Only those who engaged in religious activities or were members of the upper class had leisure time with which to learn. Such exclusive learning environments were often safeguarded by 'initiation' rites that characterized certain occupations, and this often involved activities, such as protecting secrets and codes that were inherent in esoteric knowledge.

From ancient times until the middle ages, in both eastern and western societies, knowledge production and educational learning opportunities were limited to members of certain classes. For example, in Egypt, learning hieroglyphs was limited to scribes, and in Greek city-states, only liberated (non-slave) citizens enjoyed opportunities for formal learning. In the middle ages, the parish system educated local peasants regarding Christian doctrine and rituals.

Educational changes that offered education to greater numbers of people began to appear. Charles the Great conducted the Carolingian Renaissance,' and Alfred the Great of England encouraged education and the use of the Anglo-Saxon language. However, after their deaths their efforts collapsed. Knowledge acquisition remained limited within esoteric forms. Feudal societies later introduced education in chivalry and developed guilds that involved apprenticeship learning. The foundations of universities were laid during this period. These learning environments were restricted to selected individuals, and some learning environments were more secret and esoteric than others. Some scientific societies remained closed to the public in order to avoid the Church's anti-scientific repression, and the result was that the spread of knowledge remained limited.

In the 16th century, St. Ignatius of Loyola established the Jesuit order and opened hundreds of schools that provided education for Catholics (Cubberley, 1920). Jean Baptiste de la Salle founded the Christian Brothers to provide basic education for members of the peasant classes (Compare, 1900). Johann Heinrich Pestalozzi operated an orphan asylum and focused on educating the youth, which represented a shift of educational interests from adults to children (Compare, 1900).

In many parts of Asia, such as China, educational learning was limited to a certain segment of the population. These were usually people who were studying for government positions. Among members of the general population, the influence of Confucianism led to some schooling for the general population. However, these schools tended to be involved in basic literacy and were not involved in the development and creation of knowledge. The form of education was top-down,' teacher-directed, one-way instruction – not cooperative knowledge

creation and openness to knowledge construction, as we would see in the modern era.

Historically speaking, education has generally focused on teaching limited numbers of people limited types of knowledge. This teaching style was typically restricted to one-way instruction and limited forms of knowledge. The knowledge system was exclusive and closed to those outside of that system. This did not change until public school systems were established. Even today, open and interactive teaching-learning environments are found only in some educational systems. During religious revolutions, reform-minded Protestant churches encouraged people to learn to read so that they could read the Bible. The Catholic Church countered by equipping the faithful with literacy so that the general public could enjoy opportunities to learn. These goals and methods of teaching and learning were not directly related to knowledge creation. Knowledge was restricted, controlled by authorities, and remained largely in the hands of churches, governments, and a few members of the elite. Only when democratic societies came into existence did the average person enjoy opportunities to become involved in knowledge creation. Foucault critiqued the relationship of knowledge and power, and knowledge was defined and controlled by authorities. Only after the establishment of democratic societies and post-modernism did knowledge become available to the general public.

OPEN TRADITIONS AND OPEN SYSTEMS

The change from esoteric knowledge to open knowledge and education is related to two major frameworks. One framework is the development of technology; the other is the establishment of democratic societies. The first aspect is the development of technology and its influences. The transformation to open knowledge is due to changes in social institutions and systems and in technological developments that have played an important role in this transformation. Gutenberg's invention of the movable-type printing press amplified the spread of knowledge through the new technology of printed books, which allowed for the sharing of knowledge with large numbers of people. However, although it is true that printing presses reduced the costs of reproducing books, it did not necessarily lead to greater openness. Long (2001) claimed that openness of writing and authorship involved contexts of society, culture, and economics. The educational systems described had long been esoteric in many respects; technology and the arts had long traditions of open culture.

Open knowledge is part of the history of the development of the technical arts. The ancient technē authors wrote in open form and shared with others what they wrote (Long, 2001). In ancient Greece and Rome, the openness praxis writings were shared only by members of certain classes of readers, particularly governors and military leaders (Long, 2001). In the 15th century, open authorship in the mechanical arts expanded (Long, 2001). In the 16th century, materials concerning mining, metallurgy, artillery, and fortifications represented a form of open, and sometimes collective, authorship that included both practitioners and authors

(Long, 2001). Communications about painting, architecture, and the arts also crossed social boundaries, and practitioners and patrons interacted with each other over issues that included learning, technical skills, and art (Long, 2001). The separation of open and secret perspectives were blurred when it came to technological developments. The narrowing of openness in technical manufacturing, and concerns over property and copyrights became part of the culture of the new scientific age. This new scientific age was a sign that intellectual copyrights and property were respected. However, if knowledge systems become too restricted and esoteric, this limits knowledge development and innovation to some degree. Long (2001) argued that the open concepts of the past served as the foundation for experimental science development in the 17th century.

These scientific developments were followed by the Industrial Revolution, which produced two key types of influences on society, which in turn changed the educational systems. First, the economic structures changed when the labor force shifted from farming to industrial production, and this coincided with the development of the welfare system, which provided education for its citizens. Mechanized agriculture could feed more people with fewer laborers. Many people left farms to work in factories in burgeoning cities. New legal restrictions prohibited child labor, and some countries developed mandatory school attendance laws that gave many children opportunities to become educated. For example, in the 18th century Prussia began to require children to attend school, and established a Department for Public Instruction (Monroe, 1970). In England, the Elementary Education Act[4] of 1870 mandated compulsory children's education between the ages of five and twelve. Public education systems were established in modern societies and education became perceived as a human right. Second, the increasingly complex types of work carried out in industrial societies required investments in human capital. Global competition increased government awareness of the value of human recourses. The Knowledge Economy, and the creative economy that came later, emphasized individual intellectual abilities.

The second aspect of open knowledge is the democratic process. In democratic societies, members of the public were able to learn and participate in knowledge production in the context of an open society. More institutions and people became involved in the knowledge-building process, and this became a hallmark of democratic societies. Masuda (1981) stated that the vision of an information society is that every individual can access information and interact through information systems as a manifestation of democracy. Hirsh (1987) claimed that in democratic societies, all citizens require basic knowledge – what Hirsh termed cultural literacy – in order to communicate and become involved in democratic interaction.

Open system theory maintains concepts of openness. Marion (1999) stated that open systems have particular characteristics that include being holistic, interactive, and cybernetic, while adjusting for feedback. Open system perspectives provide the open or cross boundaries, which create interactive relationships among systems and exhibit openness to relationships with other systems. The term—open system describes some important features of open education. An open system can be seen as a nonlinear systematic perspective that involves internal activities, the external

environment, and feedback influences. Open system theory claims that external factors, to a greater extent than internal factors, influence internal activities (Marion, 1999). In open education, knowledge construction is open and includes cross-disciplinary participants. Knowledge systems are no longer esoteric and limited, and are now open to collective contributions from people in different disciplines and living systems. Feedback from sources outside of the original system plays an important role in the construction of knowledge.

The continuous development of openness provides the foundation for open knowledge and education in the current era. As technology develops and spreads, democracy encourages open and interactive societies, and open knowledge concepts arise. The next section will examine changes in education and knowledge systems.

THE SHIFT IN EDUCATION AND KNOWLEDGE SYSTEMS IN THE MODERN ERA

Contemporary industrial societies exhibit the influences of commercial media and promote the perspective of open knowledge development. In the 1950s, the U.S. Department of Defense had a research arm then known as the Advanced Research Project Agency (ARPA), which connected different computer networks. What would become known as the Internet' was created in 1969 to connect ten college research laboratories. The commercialization of the Internet changed forms of communication and social interaction. New forms of communication have changed social interactions and decentralized concepts of identity, nationalism, and citizenship (Tukdeo, 2008).

The representative technology is no longer a machine with fixed architecture carrying out a fixed function. It is a system, a network of functionalities—a metabolism of things-executing-things—that can sense its environment and reconfigure its actions to execute appropriately. When a network consists of thousands of separate interacting parts and the environment changes rapidly, it becomes almost impossible to design top-down in any reliable way.

> 'Therefore, networks are being designed to—learn from experience which simple interactive rules of configuration operate best within different environments' (Arthur, 2009, pp. 206–207).

Technology was not merely a series of mechanical improvements that impelled openness; it also profoundly influenced culture and societies. Heidegger and Foucault thought of technology as a means of revealing truth and influencing human subjectivity (Besley & Peters, 2007). Heidegger thought of technology as a unification of minds, fine arts, and human activities—a process that revealed truth (Heidegger, 1977). Foucault followed Heidegger's perspectives on technology as a way of revealing truth, and extended it to include power relationships and the construction of subjectivity (Besley & Peters, 2007). Derrida's inventionalism referred to open attitudes that added to human interaction and communication, and it was not a mechanical form of openness toward in-coming others (Bista, 2009). Technology became composed more of biological characteristics and fewer mechanistic characteristics for two reasons. First, technologies were

simultaneously mechanistic and organic. Second, technologies were acquiring properties that involved self-assembly, self-configuration, self-healing, and cognition, which thus made them resemble living organisms (Arthur, 2009). Open societies and technological developments encouraged individuals to express and construct their own subjectivities.

Changes in technology influenced industrial production processes and knowledge construction. Knowledge construction became open to the public through the Internet and the development of social openness. Democratic societies encouraged the public to attend to public affairs and communicate, which resulted in more people becoming involved in social movements and becoming concerned with public issues. Technological developments facilitated sharing information and communication. Society and technology-based interactions propelled the growth of openness in knowledge production and education.

> — 'The theoretical knowledge, the collaborative work style, and the information technologies associated with government-sponsored research and science have indeed become increasingly important elements of society' (Turner, 2006, p. 242).

Creative economies and open education combine with technology to influence social and cultural aspects and can lead to peer-to-peer knowledge production. Gates (2006) used the term Information democracy' to indicate the sharing of free information within the software development process that leads to better knowledge management and changes in the relationship between information and democracy. Information technology has played an important role in social culture. Peters (2007a.) claimed that information has been a central feature of democracies since early social modernized formulation. Benkeler (2003) further stated that political economy has changed as a result of the decentralizing influences that have been brought on by information production. Information changes and supports democratic process of a society.

THE RELATIONSHIP BETWEEN OPEN KNOWLEDGE PRODUCTION AND OPEN EDUCATION

The growing and overlapping concepts of open source, open access, open archiving, and open publishing provide the foundation for openness culture and alternative modes of social production and innovations (Peters, 2010a.). Open knowledge production has become the fundamental concept of open education. Peer-to-peer (P2P) is an important characteristic of relationships for integrating open knowledge production and open education.

OPEN KNOWLEDGE PRODUCTION IS A BASIC IDEA IN OPEN EDUCATION

Open knowledge production is a fundamental concept in open education, one that results from the openness culture and collective knowledge production. The openness culture that derives from open knowledge production is a core concept in open education.

The concept of open knowledge production provides a basic theoretical framework and practical applications for open education. The open and collaborative elements of open knowledge production also serve the fundamental needs of open education. Open and collaborative cultures of knowledge production are rooted in peer review culture and have been transformed into a perspective of open knowledge. First, the peer review culture of the academic world respects self-evaluation and quality improvements in the academic community that are related to openness, changing ideals and procedures, and critical perspectives. Open knowledge production is recognized as being related to open science concepts. Peters (2007b.) stated that global and open science is changing the world to the extent that the era of scientific superpowers may be coming to an end (Hollingsworth, et al, 2008). David (2003) wrote about the origins of open systems in intellectual property32. The following quote comes from his article summary about―The Economic Logic of Open Science'[5]:

> Open science' institutions provide an alternative to the intellectual property approach to dealing with difficult problems in the allocation of resources for the production and distribution of information. As a mode of generating reliable knowledge,―open science depends upon a specific nonmarket reward system to solve a number of resource allocation problems that have their origins in the particular characteristics of information as an economic good....the collegiate reputational reward system...[has been]... conventionally associated with open science practice in the academy and public research institutes...open science is properly regarded as uniquely well suited to the goal of maximizing the rate of growth of the stock of reliable knowledge.

Open knowledge production can be examined from the perspectives of open science to include different aspects of knowledge disciplines. Open knowledge production encourages open and collective intellectual knowledge creation. This process provides open education with a model for knowledge production and learning. This encourages individual intellectual contributions and increases knowledge capital.

PEER TO PEER (P2P) KNOWLEDGE PRODUCTION IN OPEN EDUCATION

Open knowledge production based on collective knowledge production is a practical form of open education. Peer to Peer (P2P) is a approach in which open knowledge production can be used in open education. Improvements in openness and communication make―peer-to-peer (P2P) interactions more effective. Within this P2P network, knowledge becomes more productive (with the use of cooperative production) and can transform open knowledge production into open education practices.

Open knowledge imparts an open attitude to the construction of knowledge. Gates (2006) uses the term―information democracy" to indicate that software development increases the free sharing of information, leads to better knowledge

management and changes the relationship between information and democracy. Information technology plays several important roles in social culture. Information is an important influence on democratic society development for individual interaction and the means of political economy (Peters, 2007a; Benkler, 2003). Benkler (2006) stated that changes in information technologies change how individuals interact with information, knowledge and culture, and how such changes affect human freedom. Benkler and Nissenbaum (2006) argued that based on communication technology peer production offers opportunities for more people to produce informational goods as well as opportunities to practice socially responsible behavior. The socio-technical system may involve moral and political values (Benkler and Nissenbaum, 2006). These changes promote the production of open knowledge, as well as practical applications, such as Peer-to-Peer (P2P) productions.

P2P productions are a practical aspect of open knowledge production and an application that can be used in open education. As regards P2P, Bauwens (2010) stated:

> Global communication has shown itself capable of being hyper-productive in creation of complex knowledge products, free and open source software, and increasingly, open design associated with distributed manufacturing. In other words, a hybrid form of production has emerged that combines the existence of global self-managed open design communities, for-benefit associations in the form of foundations that manage the infrastructure of cooperation, and an ecology of associated businesses that benefit from and contribute to this commons-based peer production. (p. 311)

Open knowledge production is based on openness and collective intelligence. In addition, collective knowledge requires participation. Peer networking encourages participation and positive production output. New relationships among societies, enterprises, and individuals become established within this peer network. Bauwens used the term "New Social Contract" to explain the changes in these new relationships. Bauwens' "New Social Contract" includes:

1. Expanding entrepreneurship to civil society and the base of the [social] pyramid
2. New institutions that do well by doing good (outcome-based enterprises)
3. Social financing mechanisms based on peer-to-peer aggregation
4. Mechanisms that sustain social innovation (co-design, co-creation) and peer production by civil society
5. Participatory businesses and other organizations focus on localized, precision-based physical production in small series that are nevertheless linked to global open-design communities. (Bauwens, 2010, pp. 311–312)

Within the context of this new social contract, the basis of socioeconomic development is P2P relationships. The P2P social process helps to create the following factors:

1. **Peer production**: Occurs when a group of peers decides to engage in production from common resource.

2. **Peer governance**: Peers choose to govern themselves while engaging in such pursuits.
3. **Peer property**: The institutional and legal framework they choose guards against the private appropriation of common work. This usually takes the form of non-exclusionary forms of universal common property, as defined through the General Public License, some forms of the Creative Commons Licenses, or similar derivatives (Bauwens, 2010, p. 313).

SERVE THE PUBLIC GOOD AND ACT AS A FORM OF SOCIAL BUSINESS

Collective knowledge production that arises from creative economies and open education can serve the public good. The idea of collective knowledge production can be applied to social business concepts. There are two methods for analyzing this relationship. The first methods of analyzing this idea uses the direct perspective, in which open knowledge is given to everyone so that even the poor and marginalized can learn how to change their economic situation. The second method of analyzing this idea involves using knowledge as capital, because collective knowledge impels institutions with knowledge capital to invest in those that have less knowledge capital.

The concepts of social business require an explanation. Yunus (2008; 2010) stated that social businesses have certain requirements:

1. Social objectives: They should have positive social objectives.
2. Profit distribution: Investors cannot take profits out of enterprises as dividends.
3. Businesses can be classified as social businesses if they are owned by those in poverty, so that making profits promotes the social objectives of the businesses.

Ideally, social businesses should be owned by disadvantaged or poor people so that the disadvantaged or poor are aided in escaping poverty. As regards the first perspective (of offering knowledge to individuals), creative economies and open education can provide knowledge capital to every individual. Knowledge is the key element for competing in the global society.

When viewing knowledge as a form of capital, investing in knowledge can be seen as a type of social business. Peters (2007b) stated that knowledge capitalism concerns understanding knowledge and its value within the context of social relationships. Institutions with surplus knowledge capital are able to act as entrepreneurs that invest in those who lack knowledge capital. Knowledge production can thus serve as a public good (Samuelson, 1954; Marginson, 2007; Marginson, 2009). Marginson (2007) argued that the global public good and private goods in higher education are not zero-sum games, but rather, are often interdependent. However, there remains limitation regarding knowledge access and creation. Institutions with greater amounts of knowledge capital can invest in the disadvantaged or the knowledge-poor. Knowledge-poor individuals may improve their status by accepting knowledge investments. This can help bring about improvement in entire socioeconomic levels of knowledge.

CONCLUSION

Open knowledge production is a form that combines openness culture and collaborative intelligence. Knowledge-producing systems have changed throughout history and through the course of various philosophical perspectives. Openness perspectives and improvements in communication technologies have encouraged open knowledge production. Open knowledge production encourages collective and collaborative knowledge interactions and production among individuals.

Open education is a form of open knowledge production application. Open education has developed in conjunction with open concepts and improvements in communication technology. The relationship between open knowledge production and open education is such that open knowledge provides the underlying concepts that support open education. P2P is a practical aspect of open knowledge production that can imply the existence of open education.

NOTES

[1] O'Reilly explained Web 2.0, Retrieved Nov., 18, 2010, from: http://oreilly.com/pub/a/web2/archive/what-is-web-20.html?page=1

[2] O'Reilly explained Web 2.0, Retrieved Nov., 18, 2010, from: http://oreilly.com/pub/a/web2/archive/what-is-web-20.html?page=5

[3] Web 2.0, Retrieved Nov., 18, 2010, from: http://oreilly.com/web2/archive/what-is-web-20.html

[4] UK, Elementary Education Act. Retrieved May, 3, 2011, from: http://www.thepotteries.org/dates/education.htm

[5] The conference Science in the 21st Century. Retrieved Jan., 10, 2011, from: http://www.science 21stcentury.org /abstracts.html

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CHAPTER 2

CREATIVITY, OPENNESS AND THE GLOBAL KNOWLEDGE ECONOMY: THE ADVENT OF USER-GENERATED CULTURES

INTRODUCTION

This chapter investigates the relation between creativity and the global knowledge economy focusing on the characteristics of knowledge as a global public good and digital information goods in so far as they approach 'pure thought'. The chapter then explores the relations between openness and creativity through a review of the literature and by reference to 'social creativity' as evidenced in user-generated cultures.

CREATIVITY AND THE GLOBAL KNOWLEDGE ECONOMY[1]

The global knowledge economy, comprised of increasingly integrated cross-border distributed knowledge and learning systems, represents a new stage of development that is characterized by a fundamental sociality – knowledge and the value of knowledge are rooted in social relations. More than any time in the past, the global economy and society are undergoing a massive transformation from an industrial age that was dominated by the logic of standardized mass production and epitomized by the assembly-line in the auto-industry to a knowledge economy that is characterized by decentralized networked communications. These communication systems reflect "intellectual capital" in a range of information-service industries that are propelled by brainpower and the constant demand for innovation. These innovations do not mean the demise of the industrial economy but rather the development of a new relation between manufacturing and information services that permit the sharing of knowledge through open source models and the continuous redesign of flexible production regimes. It also means the rapid development of "mind-intensive" industries, especially in the software, media, healthcare, education, and other mind-intensive industries. Increasingly, the move to the knowledge economy redefines the value creation process, alters the organization and pattern of work, and creates new forms of borderless cooperation and intercultural exchange. This dynamic has led many national government and international organizations to plan for a restructuring of the economy that increasingly focuses on knowledge, education, and creativity. The New Club of Rome, for instance, calls this new era the paradigm of an "economy of the intangibles" and predicts "Third Phase Industries," "sustainable development" and the development of "intellectual capital":

- This trend means that the intellectual, social, and cultural issues require much higher attention. They are the determinants of Third Phase Industries based on creativity, software, media, finance, services, and, more generally, combined intelligence. These qualities are more representative of today's developed economies, and they produce more value than traditional manufacturing per se. They are of decisive importance to the development of all sectors, including traditional ones. Only through careful and sustainable utilization of the new, nonmaterial resources will we be in a position to better organize material and energy resources that are increasingly in short supply.
- More specifically the "Ever More" of the current economic model of the Western industrial society has outlived its legitimacy. What matters are not mere survival strategies or linear expansion, but rather sustainable preservation so that we can retain our prosperity. In order to master the future, we need more intelligent modes of cultivation and exploitation and a new balance between material and nonmaterial resources.
- Intellectual capital (comprising assets such as human abilities, structural, relational, and innovation capital, as well as social capital) founded on clear, practiced values such as integrity, transparency, cooperation ability, and social responsibility, constitute the basic substance from which our future society will nurture itself.[2]

The postindustrial society, a term invented by Arthur Penty, a British Guild Socialist and follower of William Morris, at the turn from the nineteenth to the twentieth century, was based on craft workshop and decentralized units of government. The postindustrial society is marked by the change from a goods-producing to a service economy and the widespread diffusion of "intellectual technologies." For Daniel Bell (1973) the concept of post-industrialism dealt primarily with changes *in the social structure* including the shift from a goods-producing economy to a service economy, the centrality of theoretical knowledge for innovation, the change in the character of work, and the shift from a game against nature to a game among persons. His early account given in the 1970s – before the invention of the Internet and the spread of communications networks – did not foresee the phenomenon of virtualization or the emergence of personalization as a 24/7 totally person-centered, unique learning environment (Peters, 2009a).

Although there are different readings and accounts of the knowledge economy, it was only when the OECD (1996) used the label in the mid-1990s and it was adopted as a major policy description/prescription and strategy by the United Kingdom in 1999 that the term passed into the policy literature and became acceptable and increasingly widely used. The "creative economy" is an adjunct policy term based on many of the same economic arguments – and especially the centrality of theoretical knowledge and the significance of innovation. Most definitions highlight the growing relative significance of knowledge compared with traditional factors of production – natural resources, physical capital and low-skill labor – in wealth creation and the importance of knowledge creation as a source of competitive advantage to all sectors of the economy, with a special

emphasis on R&D, higher education and knowledge-intensive industries such as the media and entertainment. At least two sets of principles distinguish knowledge goods, in terms of their behavior, from other goods, commodities, or services; the first set concerns Knowledge as a Global Public Good—close to Peters 2010 in Global Creation or 2009 Creativity and the Global knowledge economy; the second concerns the digitalization of knowledge goods.

These features have led a number of economists to hypothesize the knowledge economy and to picture it as different from the traditional industrial economy, leading to a structural transformation. In *The Economics of Knowledge* (2004) Dominique Foray argues:

> Some, who had thought that the concepts of a new economy and a knowledge-based economy related to more or less the same phenomenon, logically concluded that the bursting of the speculative high-tech bubble sealed the fate of a short-lived knowledge-based economy. My conception is different. I think that the term 'knowledge-based economy' is still valid insofar as it characterizes *a possible scenario of structural transformations of our economies*. This is, moreover, the conception of major international organizations such as the World Bank and the Organisation for Economic Cooperation and Development (OECD). (p. ix, emphasis added).

In this scenario "the rapid creation of new knowledge and the improvement of access to the knowledge bases thus constituted, in every possible way (education, training, transfer of technological knowledge, diffusion of innovations), are factors increasing economic efficiency, innovation, the quality of goods and services, and equity between individuals, social categories, and generations." He goes on to argue that there is a collision between two phenomena – "a long-standing trend, reflected in the expansion of 'knowledge-related' investments" and "a unique technological revolution."

KNOWLEDGE AS A GLOBAL PUBLIC GOOD

The first set of principles concerning knowledge as an economic good indicate that knowledge defies traditional understandings of property and principles of exchange and closely conforms to the criteria for a public good:

1. knowledge is *non-rivalrous*: the stock of knowledge is not depleted by use, and in this sense knowledge is not consumable; sharing with others, use, reuse, and modification may indeed add rather than deplete value;
2. knowledge is barely *excludable*: it is difficult to exclude users and to force them to become buyers; it is difficult, if not impossible, to restrict distribution of goods that can be reproduced with no or little cost;
3. knowledge is not *transparent*: knowledge requires some experience of it before one discovers whether it is worthwhile, relevant, or suited to a particular purpose.

Thus, knowledge at the *ideation* or *immaterial* stage considered as pure ideas operates expansively to defy the law of scarcity. It does not conform to the traditional criteria for an economic good, and the economics of knowledge is, therefore, not based on an understanding of those features that characterize property or exchange and cannot be based on economics as the science of the allocation of scarce public goods. Of course, as soon as knowledge becomes codified or written down or physically embedded in a system or process, it can be made subject to copyright or patent and then may be treated and behave like other commodities (Stiglitz, 1999a).

DIGITAL INFORMATION GOODS APPROXIMATING PURE THOUGHT

The second set of principles apply to digital information goods insofar as they approximate pure thought or the ideational stage of knowledge, insofar as data and information through experimentation and hypothesis testing (the traditional methods of sciences) can be turned into justified true belief. In other words, digital information goods also undermine traditional economic assumptions of rivalry, excludability, and transparency, as the knowledge economy is about creating intellectual capital rather than accumulating physical capital. Digital information goods differ from traditional goods in a number of ways:

1. Information goods, especially in digital forms, can be copied cheaply, so there is little or no cost in adding new users. Although production costs for information have been high, developments in desktop and just-in-time publishing, together with new forms of copying, archiving and content creation, have substantially lowered fixed costs.
2. Information and knowledge goods typically have an experiential and participatory element that increasingly requires the active co-production of the reader/writer, listener and viewer.
3. Digital information goods can be transported, broadcast, or shared at low cost, which may approach free transmission across bulk communication networks.
4. Since digital information can be copied exactly and easily shared, it is never consumed (see Varian, 1998; Morris-Suzuki, 1997; Davis & Stack, 1997; Kelly, 1998).

The implication of this brief analysis is that the laws of supply and demand that depend on the scarcity of products do not apply to digital information goods.

CREATING THE CREATIVE ECONOMY

Today there is a strong renewal of interest by politicians and policy-makers worldwide in the related notions of creativity and innovation, especially in relation to terms like “the creative economy,” “knowledge economy,” “enterprise society,” “entrepreneurship,” and “national systems of innovation” (Baumol, 2002; Cowen, 2002; Lash & Urry, 1994). In its most obvious form the notion of the creative economy emerges from a set of claims that suggests that the Industrial Economy is

giving way to the Creative Economy based on the growing power of ideas and virtual value – the turn from steel and hamburgers to software and intellectual property (Florida, 2002; Howkins, 2001; Landry, 2000).

In this context increasingly policy latches onto the issues of copyright as an aspect of IP, piracy, distribution systems, network literacy, public service content, the creative industries, new interoperability standards, the WIPO and the development agenda, WTO and trade, and means to bring creativity and commerce together (Cowen, 2002; Shapiro & Varian, 1998; Davenport & Beck, 2001; Hughes, 1988; Netanel, 1996, 1998; Gordon, 1993; Lemley, 2005; Wagner, 2003). At the same time, this focus on creativity has exercised strong appeal to policy-makers who wish to link education more firmly to new forms of capitalism emphasizing how creativity must be taught, how educational theory and research can be used to improve student learning in mathematics, reading and science, and how different models of intelligence and creativity can inform educational practice (Blythe, 2000).

Under the spell of the creative economy discourse, there has been a flourishing of new accelerated learning methodologies together with a focus on giftedness the design of learning programs for exceptional children.[3] One strand of the emerging literature highlights the role of the creative and expressive arts, of performance, of aesthetics in general, and the significant role of design as an underlying infrastructure for the creative economy (Caves, 2000; Frey, 2000; Frey & Pommerehne, 1989; Ginsburgh & Menger, 1996; Heilbron & Gray, 2001; Hesmondhalgh, 2002). There is now widespread agreement among economists, sociologists, and policy analysts that creativity, design, and innovation are at the heart of the global knowledge economy: together creativity, design, and innovation define knowledge capitalism and its ability to continuously reinvent itself.[4] Together and in conjunction with new communications technologies, they give expression to the essence of digital capitalism – the "economy of ideas" – and to new architectures of mass collaboration that distinguish it as a new generic form of economy different in nature from industrial capitalism.

The fact is that knowledge in its immaterial digitized informational form as sequences and value chains of 1s and 0s – ideas, concepts, functions, and abstractions –approaches the status of pure thought. Unlike other commodities, it operates expansively to defy the law of scarcity that is fundamental to classical and neoclassical economics and to the traditional understanding of markets. As mentioned above a generation of economists has expressed this truth by emphasizing that knowledge is (almost) a global public good: it is non-rivalrous and barely excludable (Stiglitz, 1999b; Verschraegen & Schiltz, 2007). It is non-rivalrous in the sense that there is little or only marginal cost to adding new users. In other words, knowledge and information, especially in digital form, cannot be consumed. The use of knowledge or information as digital goods can be distributed and shared at no extra cost, and the distribution and sharing is likely to add to its value rather than to deplete it or use it up. This is the essence of the economics of file-sharing education; it is also the essence of new forms of distributed creativity,

intelligence and innovation in an age of mass participation and collaboration (Brown & Duguid, 2000; Tapscott & Williams, 2006; Surowiecki, 2004).

OPENNESS AND CREATIVITY

There is a long established literature on openness and creativity in the field of personality psychology emphasizing the uniqueness of the individual. Prabhu et al. (2008, p. 53), for instance, report that four decades of work have generated more than 9,000 published studies. They also report that in the five-factor model of personality – based on openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism – "openness to experience has the most empirical support as being closely related to creativity." In this context, openness is correlated with the appreciation for art, emotionality, sense of adventure, new ideas, imagination, curiosity, and variety of experience. On this psychological reading open people prefer novelty and change, and tend to be more aware of their feelings with a corresponding willingness to tolerate diversity and entertain new ideas. Those people with "closed" personality, by contrast, tend to exhibit more traditional and conventional interests and prefer familiarity over novelty and change. The five-factor personality psychology is purely descriptive rather than theory driven, and current research is testing the cross-cultural and social validity of the program. While it is still in progress, this research at least raises the strong possibility of the close correlation of openness with creativity at the level of individual personalities emphasizing the relation to concepts of measured intelligence, achievement, and political attitudes (Simonton, 2000; Aitken, 2004; Dollinger, 2007).

Individualist approaches to the relation of openness to creativity can only take us so far. The National Academy of Sciences' (2003) report *Beyond Productivity: Information Technology, Innovation and Creativity*, began by recognizing the crucial role that creativity plays in culture and the way in which at the beginning of the twenty-first century, "information technology (IT) is forming a powerful alliance with creative practices in the arts and design to establish the exciting new domain of information technology and creative practices." Others such as Richard Florida (2004) have emphasized that the United States needs to invest more in the development of its creative sector as a basis to sustain its competitiveness from the rate of technological innovation and economic growth. Florida (2002, p. 21) argues "human creativity as the defining feature of economic life... . [New] technologies, new industries, new wealth and all other good economic things flow from it," and he goes on to write "[Human] creativity is multifaceted and multidimensional. It is not limited to technological innovation or new business models. It is not something that can be kept in a box and trotted out when one arrives at the office. Creativity involves distinct kinds of thinking and habits that must be cultivated both in the individual and in the surrounding society" (p. 22). Rutten and Gelissen (2008) test Florida's creativity and diversity hypothesis for European regions, and their results indicate that regional differences in diversity are directly related to differences in wealth between regions.

The relation between openness and creativity is brought out even more forcefully through the concept and practice of open innovation. Peter Teirlinck and Andre Spithoven (2008) indicate that the increasing complexity of innovation has encouraged companies to use external knowledge sources to complement in-house activities, attempting to substitute a nonlinear feedback model for the old linear model, capturing the benefits of the learning process within and between firms and other organizations. As innovation networks grew even more complex, firms adopted the "new imperative" for creating and profiting from technology in the model of open innovation where innovation becomes increasingly distributed among various partners (Von Hippel, 1988). They write:

> The notion of open innovation is the result of the increasing complexity of innovation and how innovation management should cope with this complexity. It reflects an ever changing research environment (Chesbrough, 2001): the increasing mobility of knowledge workers; the applicability of research results of universities to enterprises; more widely distributed knowledge; erosion of oligopoly market positions; more deregulation and an increase in venture capital. This resulted in an open stage gate process with the following features: (1) the centralized inhouse R&D laboratory is no longer the main source of ideas or knowledge and is being complemented by other enterprises, new technology based start-ups, universities, and public research centres; (2) commercialization also occurs outside the traditional markets of the enterprise through licensing, spin-offs, and research joint ventures; (3) the role of the first mover advantage becomes more important than the development of a defensively orientated system of knowledge and technology protection. (p. 689)

This model of open innovation is made possible through "creativity support tools" that help to accelerate discovery and innovation. Ben Shneiderman (2007) notes that new "generations of programming, simulation, information visualization, and other tools are empowering engineers and scientists just as animation and music composition tools have invigorated filmmakers and musicians." He goes on to write:

> These and many other creativity support tools enable discovery and innovation on a broader scale than ever before; eager novices are performing like seasoned masters and the grandmasters are producing startling results. The accelerating pace of academic research, engineering innovation, and consumer product design is amply documented in journal publications, patents, and customer purchases Creativity support tools extend users' capability to make discoveries or inventions from early stages of gathering information, hypothesis generation, and initial production, through the later stages of refinement, validation, and dissemination.

The sustainability of "social creativity" depends upon a greater recognition of the importance of social and material surroundings. As Fischer and Giaccardi (2007)

argue "Individual and social creativity can and must complement each other." They suggest:

> Environments supporting mass collaboration and social production such as annotated collections (GenBank), media sharing (Flickr, YouTube), wikis (Wikipedia), folksonomies (del.icio.us), and virtual worlds (Second Life) are other examples of social creativity. The diverse and collective stock of scientific content and artistic or stylistic ideas that individuals and communities share, reinterpret, and use as a basis for new ideas and visions constitutes the vital source of invention and creativity.

They argue that creativity needs the "synergy of many" which can be facilitated by meta-design – "a sociotechnical approach that characterizes objectives, techniques, and processes that allow users to act as designers and be creative in personally meaningful activities," and they note a tension between creativity and organization. Organizational environments must be kept open to users' modifications and adaptations by technical and social means that empower participation to serve the double purpose: "to provide a potential source for new insights, new knowledge, and new understandings; and to provide a higher degree of synergy and self-organization."

The relationship between creativity and open systems especially in computing is growing in significance. Colin G. Johnson (2005) draws a strong set of connection between openness, creativity, and search processes. He begins by noting that "One characteristic of systems in which creativity can occur is that they are open. That is, the space being explored appears to be (theoretically or pragmatically) unbounded, and there is no easy way in which the structure of the space can be simply summarized." He suggests that evolutionary search processes (moving from one-to-point, using the information from previously visited sites) are seen as creative for one of three reasons:

> Firstly because the criteria for evaluation are not easy to capture in a rulebound fashion. An example of this is searching a space of melodies for 'interesting' or 'tuneful' melodies. Secondly because the search space is seen as having some complexity which belies 'easy' search. Examples of this [sic] ideas include the use of search to explore the space of designs for mechanical devices or electrical circuits. Even though an exhaustive search would turn up the same result as a 'creative' search, both the size of the search space and the complex structure thereof (e.g. it is not possible for a 'naïve' thinker to conceive of how to specify and order the 'all possible' designs). Thirdly, because the search space is seen as being extensible. Consider the idea of searching a space of melodies as discussed above. In order to search this space, we will need to give a description of what a 'melody' is – e.g. a sequence of notes in a particular key. However this definition has limitations: what about a melody that changes key half way through? So we expand the search space to include such melodies, then... . The search space can always be extended. It is these latter two characteristics which seem particularly to

> capture the idea of 'openness' in creativity. (http://kar.kent.ac.uk/14358/1/VarietiesColin.pdf)

Open source in computing developed around Linux as an operating system where in such open systems intellectual property is seen as "open" and is made freely available, allowing people to use ideas and code without locking them up as private intellectual property. It is based on three essential features (Tippet, 2007, updated from Weber, 2004):

- source code is distributed with the software, or made available at no more cost than distribution (this means that users can see and change the actual mechanisms that makes the software work);
- anyone may distribute the software for free (there is not obligation for other users of the software to pay royalties or licensing fees to the originator);
- anyone may modify the software, or develop new software from the original product, and the modified software is then distributed under the same terms as the original software (e.g., it remains open).

As Weber comments these concepts represent a fundamentally different concept of property, typically seen as:

> a regime built around a set of assumptions and goals that are different from those of mainstream intellectual property rights thinking. The principal goal of the open source intellectual property regime is to maximize the ongoing use, growth, development, and distribution of free software. To achieve that goal, this regime shifts the fundamental optic of intellectual property rights away from the protecting the prerogatives of an author towards protecting the prerogatives of generations of users. (Weber, 2004, p. 84)

The idea of open source still retains concepts of copyright and the rights of the author or creator over their original work. As Tippet (2007) remarks: "It does thus not negate the concept of property within intellectual products, but rather shifts the view of the rights conferred by the property, so that the 'concept of property [is] configured around the right and responsibility to distribute, not to exclude' (Weber 2004: 86)." Tippet also usefully documents the emerging field that applies open source to areas of scholarship and creative endeavor outside software:

> For example, open source has been explored as a valuable approach in scientific endeavour and making scientific information available (Jones 2001; Mulgan 2005; Schweik, C., Evans and Grove 2005). Keats (2003) has explored open source in terms of developing teaching and learning resources for African universities'. In a series of articles looking at the 'Adaptive State', the potential value of open source ideas for public policy delivery are explored (Bentley and Wilsdon 2003; Leadbeater 2003; Mulgan, Salem and Steinberg 2005). The ideas have been developed in product design, linked to ideas of open innovation, as companies engage with user communities (Goldman and Gabriel 2005), one example being user-led innovation in sports gear (Fuller, Jawecki and Muhlbacher 2007).

Digital technologies have become engines of cultural innovation and user-centered content production has become a sign of the general transformation of organizational forms. However, the transformation of digital culture also transforms "what it means to be a creator within a vast and growing reservoir of media, data, computational power, and communicative possibilities." We are only now beginning to devise understandings of the power of databases, network representations, filtering techniques, digital rights management, and the other new architectures of agency and control and "how these new capacities transform our shared cultures, our understanding of them, and our capacities to act within them" (Karaganis, 2008).

As Jean Burgess (2007) comments in *Vernacular Creativity and the New Media* "The manufacturers of content-creating tools, who relentlessly push us to unleash that creativity, using – of course – their ever cheaper, ever more powerful gadgets and gizmos. Instead of asking consumers to watch, to listen, to play, to passively consume, the race is on to get them to create, to produce, and to participate" (p. 7). She goes on to register the development of a new vocabulary that speaks of a participatory culture based on creation and user-generated content.

> In game environments particularly, terms like 'co-creators' (Banks, 2002) and 'productive players' (Humphreys, 2005) are increasingly gaining purchase as replacements for 'consumers', 'players', or even 'participants'. These reconfigurations force us to consider the 'texts' of new media to be emergent – always in the process of being 'made'; further, 'co-creation' is built around network sociality and the dynamics of community, prompting a reconsideration of the idea of the individual producer or consumer of culture – even as corporate content 'owners' continue, in varying degrees, to assert rights that have their basis in the romantic notion of the individual creative author (Herman et al., 2006). It is not only the 'who' of production that is transformed in contemporary digital culture, but the *how*. (pp. 7–8)

Furthermore, Burgess details three important structural transformations from the point of view of cultural participation implied by the Web 2.0 model. I summarize from Burgess as follows:

1. The shift from content "production," "distribution" and "consumption" to a convergence of all three, resulting in a hybrid mode of engagement called "produsage," defined as "the collaborative and continuous building and extending of existing content in pursuit of further improvement" (Bruns, 2005).
2. A shift from "user-generated content" to "user-led" content creation, editing, repurposing, and distribution; whereby the users of a given Web service increasingly take on leadership roles, and where designers and developers to some extent allow the emergence of communities of practice to shape the culture of the network – even to determine what the Web service or online community is "for." This dynamic represents a convergence of the "value chain" where users are simultaneously the producers, users, editors and consumers of the content, leading to "network effects."

3. The convergence of user-generated content and social software to produce hybrid spaces, examples of which are sometimes described as "social media" (Coates, 2006) – most clearly represented by MySpace, YouTube and Flickr (Burgess, 2007, pp. 10–11)

Burgess (2007) argues:

> It is this third feature of the new networks of cultural production that has the most profound implications for cultural participation, at least in potential, because this shift opens up new and diverse spaces for individuals to engage with a variety of aesthetic experiences at the same time as their participation contributes to the creation of communities. That is, the significance of "Web 2.0," from a cultural studies point of view, lies in its potential for a new configuration of the relations between the *aesthetic* and the *social* aspects of culture, developed at a grass-roots level. (p. 11)

As many scholars and commentators have suggested since the "change merchants" of the 1970s – Marshall McLuhan, Drucker, and Alvin Toffler – first raised the issue we are in the middle of a long-term cultural evolutionary shift based on the digitization and the logic of open systems that has the capacity to profoundly change all aspects of our daily lives – work, home, school – and existing systems of culture and economy. A wide range of scholars from different disciplines and new media organizations have speculated on the nature of the shift: Richard Stallman established the Free Software Movement and the GNU project[5]; Yochai Benkler (2006), the Yale law professor, has commented on the wealth of networks and the way that social production transforms freedom and markets; his colleague, Larry Lessig (2004, 2007), also a law professor, has written convincingly on code, copyright, and the creative commons[6] and launched the Free Culture Movement designed to promote the freedom to distribute and modify creative works through the new social media[7]; Students for Free Culture,[8] launched in 2004, "is a diverse, non-partisan group of students and young people who are working to get their peers involved in the free culture movement"; Michel Bauwens (2005) has written about the political economy of peer production and established the P-2-P Foundation[9]; Creative Commons[10] was founded in 2001 by experts in cyber law and intellectual property; Wikipedia[11] the world's largest and open-content encyclopedia was established in 2001 by Jimmy Wales, an American Internet entrepreneur, whose blog is subtitled Free Knowledge for Free Minds.[12]

One influential definition suggests

> Social and technological advances make it possible for a growing part of humanity to *access, create, modify, publish and distribute* various kinds of works – artworks, scientific and educational materials, software, articles – in short: *anything that can be represented in digital form*. Many communities have formed to exercise those new possibilities and create a wealth of collectively re-usable works.

By *freedom* they mean:

- the *freedom to use* the work and enjoy the benefits of using it
- the *freedom to study* the work and to apply knowledge acquired from it
- the *freedom to make and redistribute copies*, in whole or in part, of the information or expression
- the *freedom to make changes and improvements*, and to distribute derivative works.[13]

This is how the Open Cultures Working Group – an open group of artists, researchers and cultural activists – describe the situation in their Vienna Document subtitled *Xnational Net Culture and "The Need to Know" of Information Societies:*

> Information technologies are setting the global stage for economic and cultural change. More than ever, involvement in shaping the future calls for a wide understanding and reflection on the ecology and politics of information cultures. So called globalization not only signifies a worldwide network of exchange but new forms of hierarchies and fragmentation, producing deep transformations in both physical spaces and immaterial information domains... global communication technologies still hold a significant potential for empowerment, cultural expression and transnational collaboration. To fully realize the potential of life in global information societies we need to acknowledge the plurality of agents in the information landscape and the heterogeneity of collaborative cultural practice. The exploration of alternative futures is linked to a living cultural commons and social practice based on networks of open exchange and communication.[14]

Every aspect of culture and economy is becoming transformed through the process of digitization that creates new systems of archives, representation, and reproduction technologies that portend Web 3.0 and Web 4.0 where all production, material and immaterial, is digitally designed and coordinated through distributed information systems. As Felix Staler (2004) remarks "information can be infinitely copied, easily distributed, and endlessly transformed. Contrary to analog culture, other people's work is not just referenced, but directly incorporated through copying and pasting, remixing, and other standard digital procedures." Digitization transforms all aspects of cultural production and consumption favoring the networked peer community over the individual author and blurring the distinction between artists and their audiences. These new digital logics alter the logic of the organization of knowledge, education, and culture spawning new technologies as a condition of the openness of the system. Now the production of texts, sounds, and images is open to new rounds of experimentation and development providing what Staler calls "a new grammar of digital culture." Furthermore, the processes of creativity are no longer controlled by traditional knowledge institutions and organizations but rather have emerged as platforms and infrastructures that encourage large-scale participation and challenge old hierarchies.

The shift to networked media cultures based on the ethics of participation, sharing, and collaboration, involving a volunteer, peer-to-peer gift economy has its

early beginnings in the right to freedom of speech that depended upon the flow and exchange of ideas essential to political democracy, including the notion of a "free press," the market and the academy. Perhaps, even more fundamentally free speech is a significant personal, psychological, and educational good that promotes self-expression and creativity and also the autonomy and development of the self necessary for representation in a linguistic and political sense and the formation of identity.

NOTES

[1] This chapter draws on my Introduction to *Creativity in the Global Knowledge Economy* (Peters, Marginson & Murphy, 2009).

[2] These statements are taken from the New Club of Rome's 2006 Manifesto at http://www.the-new-club-of-paris.org/mission.htm.

[3] See The Center for Accelerated learning at http://www.alcenter.com/; see e.g., The Framework for Gifted Education at http://education.qld.gov.au/ publication/production/reports/pdfs/giftedandtalfwrk.pdf.

[4] For innovation theory see the Swedish economist Bengt-Åke Lundvall's Web page at http://www.business.aau.dk/ike/members/bal.html and especially his concept of "the learning economy"; see also Globelics, The Global Network for the Economics of Learning, Innovation, and Competence Building Systems at http://www.globelics.org/.

[5] See the GNU site http://www.gnu.org/gnu/initial-announcement.html, a 2006 lecture by Stallman entitled "The Free Software Movement and the Future of Freedom" and Aaron Renn's (1998) "Free," "Open Source," and Philosophies of Software Ownership at http://www.urbanophile.com/arenn/ hacking/fsvos.html.

[6] See his bestseller *Free Culture* http://www.free-culture.cc/freeculture.pdf.

[7] See the videoblog "Free Culture, Free Software, Free Infrastructures! Openness and Freedom in every Layer of the Network" at http://www. perspektive89.com/2006/10/18/free_culture_free_software_free_infrastructures_openness_and_freedom_in_every_layer_of_the_network_flo_fleissig_episo but see also Pasquinelli's (2008) "The Ideology of Free Culture and the Grammar of Sabotage" at http://www.rekombinant.org/docs/Ideology-of-Free-Culture.pdf.

[8] See the Web site http://freeculture.org/.

[9] See the foundation at http://p2pfoundation.net/The_Foundation_for_P2P_Alternativesandthe associated blog at http://blog.p2pfoundation.net/.

[10] See http://creativecommons.org/.

[11] See http://www.wikipedia.org/.

[12] See http://blog.jimmywales.com/.

[13] See http://freedomdefined.org/Definition.

[14] See http://world-information.org/wio/readme/992003309/11343967 02.

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