OPEN EDUCATION AND THE CREATIVE ECONOMY: GLOBAL PERSPECTIVES AND COMPARATIVE ANALYSIS

BY

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DISSERTATION

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Abstract

This dissertation is to deal the issues of open education, creative economies, higher education. It also compares the performances in these aspects among different countries.

The conception of the "creative economy" develops within the context of "global neoliberalism" and "knowledge economy". These three notions are all concerned with economic development. In addition, the creative economy emphasizes the importance of creativity and cultural commodities in cultural and economical development. Open education adapts the openness concept in education and utilizes information communication technology (ICT) to enhance openness.

Open education encourages sharing educational opportunities and providing resources to a greater number of participants. The idea of open knowledge in the creative economy and open education implies the crossing of knowledge boundaries and collective knowledge creation. With its advantageous conditions, higher education can play an important role in the development of open knowledge.

From a global perspective, this dissertation adopts a statistical "comparison structure" (also known as a co-plot) to discover the categories and features of the creative economy and open education among countries and regions. Knowledge Assessment Methodology (KAM) data from the World Bank is analyzed and compared internationally.

The co-plot shows that there are differences in certain variables among countries and

regions. High GDP does not necessarily lead to a highly developed creative economy, but well collective development of some particular variables can contribute to the development of the creative economy in some countries.

The conclusion focuses on: (a) open education and its relationship to open knowledge and creative economy, (b) the role and significance of open education, (c) the role of higher education in creative economy and open society, and (d) the results of comparison structure (co-plot) and alternative models. This dissertation makes recommendation concerning the aspects of policy-making and higher education development, as well as future researches.

Key words: creative economy, open education, open knowledge, higher education, global comparison.

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Chapter 1

Introduction

Open education and creative economy have been important issues in studies about the present state of education. However, there have been only limited discussions concerning the integration of the concepts and interrelationships among open education, creative economy and higher education. On one hand, there has been a call to address economic concerns, such as increases in global neoliberalism policy considerations. In such circumstances, higher education may need to react to economic needs and challenges. On the other hand, open education and technological development provide non-traditional forms of education within higher education. In addition, examining the global development of creative economies and open education can facilitate understanding how different countries perform, as well as identifying areas where improvements are possible.

This dissertation will examine fundamental concepts concerning contemporary creative economies and open education, and will seek to provide a foundation for future research. Furthermore, this dissertation will also make a global comparison so as to clarify the relationships between creative economies and open education.

Background: Contemporary Conditions in Higher Education

This section examines the condition of, and influences on, contemporary higher education. Global neoliberalism and knowledge economy have shaped higher education

policies for several decades. In addition, the rise of creative economic societies and open education has also influenced the development of higher education. These concepts will be analyzed in Chapter Two.

Global neoliberalism and higher education

Neoliberalism is based on social and political liberty theories developed after World War II as critiquing on Nazi's socialism. The underlying assumption of neoliberalism is that individual political freedom is based on economic freedoms, which include free markets and free trade. Hayek, and the *Mont Pelerin Society* he established, promoted neoliberal concepts concerning open markets and the individual freedoms they offer (Roberts & Peters, 2008; Hayek, 1944). Popper (1945) declared that an open society is rooted in economic freedom, and this is a key concept which underlies true democracies. The neoliberalism of the 1980s took concrete form in policy ideas (Roberts & Peters, 2008). The process of economic globalization served to expand neoliberalism into the global arena. Capitalistic ideology was transformed into policy practices that incorporated neo-liberalism and spread worldwide by means of globalization. The result was that economic development tilted toward "market-oriented" policies. Global neoliberalism's original goal of preserving individual freedom contributed to political, social, and economic freedom and an emphasis on *openness* in these areas.

Today, global neoliberalism has several meanings. Holst (2007) identified two

versions of globalization. The first is a “strong version” of globalization, which involves capitalism promoting globalized economic development. The second is a “longer version” of globalization, based on Marxist political economy, which focuses on struggles among peasants and working classes within a globalized framework. Torres (2009) also claimed that there are four levels of global neoliberalism. The first level of globalization is described above and involves neoliberal advocacy of free markets. The second level, however, is ‘anti-globalization,’ which means advocacy of opposition to global neoliberalism. The third level involves a focus on global concerns, but this focus is on rights rather than on markets, as in the case of human rights. The fourth level is the global war against terrorism. Although there are different meanings of global neoliberalism, many policy makers focus on the capitalism and free market features.

Today higher education has been influenced by free-market concepts. Aspects of freedom and capitalism within education policy have been influenced by global neoliberal ideas. However, these free trade and free market concepts that influence higher education are more than capitalistic benefit-oriented concerns: they encompass broader concepts of freedom and openness.

These freedoms in trade and economic perspectives are founded upon the belief that individual freedom is based on economic freedom (Roberts & Peters, 2008). Global neoliberalism has influenced educational policy and has recognized the connection between

education and economic growth (Marginson, 1997; Marginson, 2007). Moreover, the commodities of education are the knowledge-related products that may prove transformational in fulfilling the needs of economic growth.

The creative economy

Howkins (2001) identified the term 'creative economy,' which emphasizes the relationship between economics and creativity. Creative economy has been seen as overlapping with so-called 'creative industries.' This notion has been incorporated into policy concerns in countries such as Taiwan; Hong Kong; Singapore; New Zealand; Queensland, Australia; Great Britain; and the U.S. (Hartley, 2005). In creative economy, the value of manufacturing is focused on entity products, while also emphasizing influential ideas and generalized creativity. The Organization for Economic Co-operation Development (OECD) (2000) published a book, *The Creative Society of 21st Century*, booking which the authors state that creativity is a social feature and an important element of economic growth. United Nations Conference on Trade and Development's (UNCTAD) *Creative Economy Report* (2008) defined a creative economy as one involving a set of knowledge-based economic activities that also includes cultural values and cross-cutting linkages to the overall economy. UNCTAD's(2008) definition of a "creative economy" includes some following ideas: concept based on creative assets and intellectual capital that may potentially generate socio-economic growth; involving economic, cultural and social aspects interacting with

technology and tourism objectives; generating income, creating jobs, exporting profits, as well as increasing social inclusion, cultural diversity and human development; one important policy option to promote trade and development.(More details will be discussed in Chapter two). Another relevant term is "Creative Industries." These are industries that produce tangible goods and intangible services with creative content, economic value and market objectives (UNCTAD, 2008).

After the dotcom crash of 2000, content and creativity became a focal point in IT industry activities (Hartley, 2005), an occurrence that reflects a change—from the industry's original production orientation, to a creative content orientation. Florida (2002) claimed that a new "creative class" has arisen, one whose interests are related to economic developments that involve creative innovation. Such "creative class" people may receive higher salaries because their work often promotes economic growth.

Landry (2008) claimed that large cities often value the type of creativity that empowers creative citizens' interactions and promotes economic growth. Creative economy develops a knowledge economy in order to realize the value of creative inventions in economic development. Technologies such as the Internet and Web 2.0 also promote creative industrial growth. These technologies and open concepts allow for interaction and freedom for creative activities to occur (Lessig, 2005; Meikle, 2005). In brief, creative economy influences other aspects of the economy, culture, and society, to the extent that creativity is

treated as a form of economic innovation. The production of knowledge and creative innovation has become important. Creative economy is also an indicator of openness with regard to encouraging creativity.

Open education and open knowledge

Open education developed in the 1960s in Great Britain and the U.S. Both countries provided educational opportunities for increasing numbers of students through the implementation of flexible education criteria in the pursuit of educational equality (Hill, 1975). Open education allows educational opportunities to be provided to large numbers of individuals due to improvements in communication technologies. The concept of open education concerns forms of distance education that utilize communication technology in order to make open education resources available to large numbers of individuals (Peters & Britez, 2008).

United Nations Educational, Scientific, Cultural Organization (UNESCO) (2002) defined open education as using technologies to provide education to people not for commercial purpose. Open education can also be analyzed from the 'open system perspective' of education and knowledge systems. Marion (1999) stated that open systems incorporate holistic, interactive, and cybernetic features that adjust for feedback. Open system perspectives have open and/or cross boundaries in order to create interactive relationships among systems, and are open to other relationships with other systems. 'Open systems'

embody 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 influence internal activities to a greater extent than is the case for internal factors (Marion, 1999). In open education, knowledge construction is open, and includes all participants. In addition, knowledge systems are open to collective contributions from people in different disciplines and living systems. Feedback from sources outside the original system also plays an important role in the construction of knowledge.

In brief, open education involves the concepts of open source, open content, open learning, and classrooms (Peters & Britez, 2008; Fong, 2008). Open education involves learning environments that are open to all and encourage interactive learning. Openness and a cooperative environment encourage peer-to-peer knowledge production. Peer-to-peer interactions and knowledge production become effective and important for knowledge production, as well as for creative economies (Bauwens, 2005; Bauwens, 2009; Peters, 2010a; Bauwens, 2010). Open education should thus promote collective knowledge production through the inclusive cooperation among individuals.

Integrating the creative economy and open education

Economic policy concerns have emerged from the global neoliberalism movement that helped expand the knowledge economy during the 1990s (OECD, 1996, the World Bank,

1998). By the early twenty-first century, the knowledge economy increasingly emphasized the importance of creative innovation. Some studies concluded that creativity within the context of a knowledge economy society is a new economic innovation (Florida, 2002; Howkins, 2001; Landry, 2008). In fact, the creative economy era has further integrated economic development concerns and open education concepts. Knowledge has become an important economic development innovation, and knowledge and creativity based on open education can fulfill the needs of creative economy. Open education can help provide the type of knowledge production and an open environment that encourage creativity. Creative economy societies can serve to motivate openness, and openness can motivate creativity, and vice versa.

In addition, open education can be seen as a new paradigm concerning the social products of knowledge economies (Peters, 2008a). UNESCO (2002) held a forum to discuss open courseware and open education development. Forum participants confirmed the existence of the era of the knowledge society and the need for open education. Susan D'Antoni (2007) claimed that the Open Education Resource (OER) as a means of sharing knowledge around the world remains the most important issue. Present-day open education refers to both modern OER development and the theoretical and practical openness concepts of knowledge production. Open knowledge concepts can be seen as the fundamental basis for open education, and will be further discussed in a later chapter.

Higher education seeks to become a player in the creative economy and to become a provider, promoter, and developer of open education. Collective academic research and cross-boundary cooperative studies are the main features of contemporary higher education. These features also meet the definition of a creative economy and of open education in general. Creative economies and open education value ‘openness’ and collective knowledge creation, and these qualities are related to higher education providing a platform for collective cooperation and interaction on the part of participants. By means of open education, higher education can promote creative economic development for the larger society and for institutions of higher education. Certain global policies involve relevant issues related to interactive relationships between the economy and higher education.

Rationale and Overview of This Dissertation

This dissertation examines issues concerning creative economies, open education, and higher education and their interactive relationships, particularly within the context of global policy. This section provides an overview of this dissertation, which includes the significance of the dissertation, limitations, an overview of the research methods used, and its organization.

Significance of This Study

There have been some studies done about the Creative Economy in Open Education and Higher Education, but few studies have integrated these issues. First, these three issues

(the Creative Economy, Open Education, and Higher Education) may be integrated with concepts of openness and applications for education. Second, theoretical analyses of the relationship between creative economies and open education merits further investigation. The fundamental aspects of creative economy and open education should be explored in order to determine whether they provide justifications for practical applications. Third, global comparisons provide broader perspectives regarding creative economies and open education. Different regions and social contexts may promote different types of creative economies and open education. Global comparisons facilitate the development of an overall picture of how different regions develop varying types of creative economies and open education systems.

This dissertation will attempt to offer new perspectives for policy-makers, the academic community, and entrepreneurs. As regards policy-makers, creative economies are often integral to contemporary concerns about economic growth. Open education provides ideal and practical educational opportunities to promote inclusive individual learning. With respect to the academic community, this dissertation seeks to provide an analysis of open knowledge and open education. In reference to entrepreneurs, combining analyses of creative economies and open education may help spur creative innovation and human resource development within organizations.

The theoretical investigation and empirical data analysis presented in this dissertation may provide a foundation for future research. The emerging issues of creative economy and

open education are vital topics. Higher education can be expected to play an increasingly positive role in economic growth. Adapting creative economies and open education can provide opportunities for higher education to reduce costs and extend its ability to impact global competition by increasing knowledge production. This dissertation can be expected to provide both theoretical and practical aspects of knowledge for members of, and stakeholders in, higher education.

Limitations

This dissertation has limitations founded upon different theoretical interpretations and methodological approaches. The theoretical interpretation is founded upon individual perceptions and world-views. Particular social cultural contexts or experiences may also lead to various interpretations.

The global comparison makes use of data and variables from the World Bank, which were gathered prior to 2010, and therefore, more recent global developments and changes may not be represented. The cases herein were selected to represent different regions, but may not provide a complete picture of certain aspects of development. Different countries have unique paths of development, as well as varying strengths and weaknesses. Overall comparisons make it easy to see differences among some aspects (variables).

Organization of This Dissertation

This dissertation primarily examines creative economy, open education, and higher

education relationships and applications. The first chapter provides an overview of this dissertation, including the introduction, limitations, and research questions.

The second chapter examines the broad conceptual framework of creative economies, open education, and global higher education policy. This chapter includes theoretical aspects of relevant issues. The third chapter explains and justifies the research methods used in this dissertation. These include philosophical theory interpretations and statistics drawn from comparative structure analysis. Chapter four examines philosophical arguments and justifications. The fourth chapter includes results taken from a comparative structure analysis.

The final chapter offers a summary of the findings and offers recommendations based on the results from this dissertation's theoretical and statistical analysis. This chapter provides conceptual and actionable conclusions. Concepts such as creative economies, open education, and global higher education policy are explored. These applications may be addressed based on an understanding of the concepts and practical policy implications found herein.

Research Purpose and Questions

The research purpose of this dissertation is twofold: (a) to understand and analyze the issues of open education, the creative economy, and higher education, and (b) to compare the performances in these aspects among different countries with respect to these three factors. Accordingly, this dissertation examines four major research questions:

1. What is open education, and what is its relationship to open knowledge and creative

economy?

2. What is the role and significance of open education in an open society?
3. What is the role of higher education in a creative economy and an open society?
4. What is the basis for global comparisons of creative economies and open societies? What alternative models are there for creative economies, open education, and open societies? And what are the results of such comparisons?

Overview of Methods Used in This Dissertation

Answering the above research questions initially requires clarification of the concepts and development of creative economies and open education. Second, this dissertation will conduct a policy analysis by examining the interactions and influences among creative economies, open education, and higher education. Third, this dissertation will use statistical comparative structure analyses in examining the World Bank's Knowledge Assessment Methodology (KAM) data.

The research methods to be used in this study include theoretical interpretations and policy data analysis. Theoretical interpretations will involve analyses of the literature and theories regarding creative economies, open education, and higher education, including literature reviews and discourse analysis. Fairclough (2003) claimed that language is connected to social interaction, whereas discourse analysis attempts to understand social events and how people record such events. This process of discourse analysis provides

arguments that seek to define, clarify, and discuss the natures of creative economies and open education, as well as their relationships to open knowledge and higher education policies.

The statistical use of structural comparison (also known as the ‘co-plot’ technique) involves comparing correlations (Pearson product-moment correlation coefficients) among variables and cases in order to categorize and compare different cases. The primary source of the analytical data used is drawn from the Knowledge Assessment Methodology (KAM) of the World Bank. Some variables in the KAM are categorized as responding to creative economies and open education issues (further details will be provided in later chapters). Structural comparison offers an opportunity to compare different countries and conduct a global comparison of creative economies and open education situations. It can help in the development of higher education policies that mesh with regional characteristics.

The methods used in this dissertation involve the interpretation of theories for purposes of obtaining meaning and conducting arguments, and will make use of empirical data to support our understanding of global development status.

Chapter 2

Literature Review

This chapter will examine concepts of the creative economy, open education and open knowledge. First, there will appear background information regarding how these issues arose. This will include the influence of higher education policies on the global, neoliberal world. The concepts of creative economy, open education, and open knowledge will serve as the foundation for discussions in subsequent chapters.

There are some dissertations and theses that examine the creative economy and open education issues. As regards the creative economy, some issues overlap with cultural issues. Schmidt (2010) stated that creative communities in the rural Midwest are diverse and well educated. Currid (2006) analyzed New York City players who are active in that particular creative economy. Spratley (2010) examined how lawyers are poised to play an important role in supporting the creative economy by virtue of their legal expertise.

As regards open education, some research has examined distance education. Others have examined educational alternatives and the openness of education. For example, Howard (1976) examined the historical development of open education and teacher training for open education. Schurr-Kantor (1997) investigated an open education school and how it improved. Dunn (1997) analyzed a public open education school to determine how it survived. She concluded that the core values and flexible reactions to external pressure helped the school

survive while other alternative educational institutions closed their doors. The rise of open education has been globally influential. Ozoglu (2009) investigated the needs and services of the open education system in Turkey. All of these studies provide a basis for discussions of creative economies and open education. This dissertation combines both concepts to enrich our understanding of the issues and offer applications relevant to the needs of higher education.

Background Context

Before examining creative economy, open education, and higher education, this chapter will survey the factors that lead to the changes in these issues. One key factor behind modern policies and societies is the manipulation of economic influence and benefits. Education and creative economies are influenced by this factor.

Global Neoliberalism

Certain aspects of freedom and capitalism embodied within educational policies have been influenced by global neoliberal beliefs. In fact, free trade and free markets are more than benefit-oriented concerns of capitalism. These freedoms are based on the belief that the freedom of the individual is based on a corresponding freedom in the economy (Roberts & Peters, 2008). Global neoliberalism extends its influence to educational policies and recognizes the connection between education and economic growth (Marginson, 1997; Marginson, 2007). The commodities of education are knowledge products that influence

higher education's role in knowledge production. Higher education is also influenced by free-market concepts, such as advertising directed toward college students.

The concept of global neoliberalism influences public policies. Burawoy, et al., (2000) stated that there are three methodological issues that influence interactive relationships between structures and the agency of globalization content. The first issue is "global force", which is the development of global capitalism. The second issue is "global connection", which involves the spread of local and global connections. The third issue is "global imagination", which concerns structural changes related to meaning and the influences that are produced by globalization. Massey (1994) claimed that globalization has expanded to influence social relationships. The above perspectives involve free-market ideas and interactions across national boundaries.

In addition, global neoliberalism can serve as a broader context for the knowledge economy. Robert and Peters (2008) stated that Hayek and his "Mont Pelerin Society" addressed the liberation of economy and open society as having influenced what is now known as neoliberalism. The original idea of neoliberalism was based on the assumption that economic liberty promotes individual freedom. Therefore, free markets are needed to achieve freedom of economies and individuals.

Neoliberalism took shape in policy form during the 1980s in the Thatcher government in Great Britain and the Reagan administration in the United States (Roberts & Peters, 2008).

Neoliberalism influenced governments to establish policies based upon market-oriented perspectives. Market-oriented policies encouraged the development of free markets and commoditized processes that have influenced many social aspects, including education. Public management policies based on neoliberal ideas have valued accountability and efficiency (Kehm & Lanzendorf, 2006a.; Kehm & Lanzendorf, 2006b.;Biesta, 2009; Schimank, 2007). There have also been critiques of neoliberalism based on market-driven ideologies (Sniegocki, 2008).

Stone (2001) claimed that most democratic societies have been structured around key values, such as equity, security, liberty, efficiency, and community. However, market-oriented concepts have increased the degree of conflict between efficiency and equity. Labaree (2003) pointed out three different competing values that have traditionally been the cause of struggles in education: democratic equality, social mobility, and social efficiency. The change from social democracy to market-oriented neoliberalism led to corporatization, privatization, commercialization, and demands for accountability (Lipman, 2004). This efficiency calculates the values of commodities in physical and non-physical terms. Knowledge is regarded as a commoditized product within the neoliberalism point of view. After the post-industrial and technological eras, information and knowledge became essential elements of daily life and essential to industrial production. The result was that these elements became known during the 1990s as the “knowledge economy.”

Knowledge Economy

The knowledge economy that arose during the 1990s emphasized the value of knowledge, which can serve as the basis for the development of creative economies. The knowledge economy requires intellectual labor, which in turn influences aspects of education. Open education has also been influenced by the development of the knowledge economy and by a tradition of openness, as well as technological developments--all of which will be addressed below.

The knowledge economy plays a key role in education and is also related to knowledge production. The knowledge economy has led to concerns about the relationship between knowledge production and economic growth. Schumpeter (1942) claimed that innovation was the key element in economic growth in the early 1940s. This again became an issue in the 1990s when the value of knowledge became an issue for public debate. Roberts and Peters (2008) claimed that, "The most significant material change underpinning neoliberalism in the 21st century is the rise in the importance of knowledge as intellectual capital. This change, more than any other, propels the neoliberal project of globalization." (p. 17). Neoliberalism continues to influence policy-making, and the commodification of education and economic competition has emerged to connect knowledge with profits. The knowledge economy has been recognized by the OECD (1996), the World Bank (1998), and other organizations, such as United Nations. Knowledge-economy societies value knowledge

because it is a product that can be traded, and may influence national economic improvement. Drucker (1999) stated that both the quantitative and qualitative inputs of knowledge are more important than capital, particularly since the rise of knowledge trading (regarding knowledge as tradable product) took place. The two reports below have influenced knowledge-economy policies in recent decades: one was produced by the OECD, the other by the World Bank.

OECD

The Knowledge-Based Economy (1996) is an OECD publication that recognizes that knowledge drives the growth of production and economic development. This perspective emphasizes the role of information, technology, and learning in driving economic performance. The "knowledge economy" has become the primary economic policy feature among OECD countries that are increasingly concerned about the value of knowledge and technology.

OECD has developed a "new growth theory" for understanding knowledge-based economies and their relationships with traditional economies (Roberts and Peters, 2008). In knowledge economies, "information societies" have emerged as a result of computers and communication technologies. Laborers need to continue updating their skills, which has led to the development of a "learning society." The diffusion of knowledge, the need for technology, and the development of knowledge networks and national innovation system are crucial (OECD, 1997). In addition, government activities and employment that relates to

knowledge-based economies raise new issues and concerns, such as issues about training highly-skilled laborers. In fact, knowledge economy involves innovation, technologies, human capital, enterprise aspects with influence of globalization so that social and organizational should consider the "softer" part of changes including education to achieve real knowledge economy development (Á sgeirsdóttir, 2006). The maintenance and development of knowledge economies has become a vital element in the formulation of policies.

The World Bank

The World Development Report: Knowledge for Development (the World Bank, 1998) is a report that focuses on two types of knowledge and problems, both of which are important in developing countries. The first type of knowledge concerns technology that is purely technical in nature, sometimes known as "know-how." The second type of knowledge concerns attributes, such as product quality or worker diligence. Developing countries usually lack the "know-how" found in developed countries. The report designates these differences as being "knowledge gaps." Such knowledge gaps cause developing countries to struggle with incomplete knowledge, which is identified in the report as being "information problems."(Robert & Peters, 2008). National policies and strategies should seek to narrow the knowledge gap in order to encourage development.

World Development Report: Knowledge for Development argues that international

influences and local knowledge can contribute to knowledge creation. An important part of national policy concerns education. This includes basic education, lifelong learning opportunities, and support for educational development, all of which are important for knowledge development. Making use of advanced information communication technologies increases the creation of knowledge. “The World Bank maintains its neoliberal orientation with an emphasis on open trade and privatization, although it is recast in terms of the perspective of knowledge.” (Robert & Peters, 2008, p. 22). Knowledge can be obtained at lower cost due to improvements in information technology, which has benefited private individuals. This report identifies economic development as based on the accumulation of human abilities, as well as the accumulation of information, learning, and adaptations.

In brief, the knowledge economy emphasizes the role of knowledge in economic development. These reports and ideas, which recognize the value of knowledge as a national competition, increases concerns about the quality of human capital and simultaneously affirm the importance of education. The knowledge economy also involves open knowledge, which encourages access to knowledge and environments in which knowledge is created. These issues will be examined in Chapter Four. The characteristics of a knowledge economy are listed below[1].

1. Economics is not one of scarcity, but rather of abundance. Unlike most resources that

[1] David Skyrme Associates Home Page, retrieved from: www.skyrme.com/insights/21gke.htm

become depleted when they are used, information and knowledge can be shared, and actually can be increased through application.

2. The effect of location is diminished. Using appropriate technology and methods, virtual marketplaces and organizations can be created that offer the benefits of speed, agility, around-the clock-operations, and global reach.
3. Laws, barriers and taxes are difficult to apply on a purely national basis. Knowledge and information "leaks" to wherever demand is highest and the barriers lowest.
4. Knowledge-enhanced products or services can command premium prices over comparable products, with little embedded knowledge or knowledge intensity.
5. Pricing and value depend on context. The same information or knowledge can thus vary in value for different people at different times or places.
6. Knowledge that is locked into systems or processes has a higher inherent value than when such knowledge can "walk out of the door" because it is in the minds of people.
7. Competencies…are a key component of value in a knowledge-based company, yet few companies report competency levels in their annual reports, while downsizing is often seen as a positive "cost cutting" measure.

The era of knowledge economy provides the foundation for valuing knowledge, and confirming that knowledge is an important element of economics. Moreover, the knowledge economy emphasizes the value of knowledge products, which encourages the improvement

of knowledge production processes. This type of process effectiveness can be achieved through improvements in information technology. The knowledge economy provides the fundamental basis for creative economy and open knowledge perspectives because it emphasizes the value of knowledge.

Creative Economy Concepts and Influences

Creative economy has been an important issue in recent decades. in social economics and education. Creativity is an innovation that is important for economic development and knowledge production, and this idea has attracted widespread attention. The meaning of creative economies varies, but their influence can be seen in many policies and reports, such as United Nations' Reports on creative economy (2008; 2010).

The meaning of creative economy

According to DeNatale and Wassall (2007), creative economies can be modeled in two ways. The first is in terms of the production of cultural goods and services. The second regards intellectual innovation, which drives the economic development of certain cultures (DeNatale & Wassall, 2007; Peters & Araya, 2010). However, the definition of the creative economy varies in different contexts. Therefore, understanding the creative economy requires an examination of an issue from many perspectives, which will be discussed later in this dissertation.

The tradition of culture and creative industry

There are two approaches to analyzing cultural and creative industry policies. One involves separating these two terms based on their historical aspects. The other involves analyzing cultural and creative industries by focusing on their content. First, the meaning of the term “creative economy” overlaps with, and is rooted in, the culture industry and the creative industry. The term ‘culture industry’ was originally used by the Frankfurt School for critiques of modern entertainment and media culture. Scholars such as Adorno and Horkheimar (1947), Arendt (1951), and Marcus (1964), used the term “culture industry” as a concept for critiquing mechanical reproductions of mass media advertisements and ideological inducements, which they termed the “aestheticization of politics” (Hartley, 2005). Adorno and Horkheimer used the term “Cultural industry*”* in their book, *Dialectic of Enlightenment* (1947), and many people adopted their critiques of the culture of capitalistic society. Hesmondhalgh (2007) stated that their perspectives used the culture industry as a commodity, but restricted the meaning of culture. The plural forms of cultural industry--cultural industries--have been adapted by certain French sociologists and other scholars to express the complex aspects of sources and collated ideas. This differs from Adorno and Horkheimer’s singular meaning usage, which specifies that all cultural production yields to the same unified logic (Hesmondhalgh, 2007). Miège (1989) stated that the French sociologists proposed different characteristics than did Adorno and Horkheimer.

First, the introduction of industrialization and new technologies increased commodification, but also opened up new paths for innovation in cultural production. Second, these French sociologists emphasized the presence of continuous struggle and competition between cultural industries and capitalism. Adorno and Horkheimer asserted that capitalism has already achieved economic superiority (This idea also appeared in Hesmondhalgh (2007)). Adorno and Horkheimer provided important analyses of the Cultural Industry. They pointed out their concerns about cultural aspects by using critical perspectives with respect to capitalistic influences on modern society. Although Adorno and Horkheimer's critiques on capitalism society uses the term "cultural industries", these critiques may give the potential of cultural industries to reform capitalism with pluralism and human enlightenment. Cultural industries are not passively dominated by capitalistic society. They can serve as human enlightenment projects that serve as the outcome of subjective human creations.

Industrialized cultures serve as the commoditized processes of intellectual minds. Hartley (2005) classifies the "cultural industry" of Europe and the 'cultural industry' of the United States in separate categories. That of Europe is more tightly connected with national culture, while that of the United States is more tightly connected with market perspectives. The term 'cultural industry' serves as a form of criticism and a form of analysis of both cultural values and modern mass communication.

As regards creative industries, they are also referred to as creative economies (Henry,

2007). Hawkins (2001) identified the term as recognizing that innovation and creativity are the key potential elements in contemporary economic growth. According to Department for Culture Media and Sport (DCMS, in UK) (2001), creative industries are knowledge-based enterprises involved in creating and exploiting intellectual production and property. The global market value identified as being associated with the creative economy was US $831 billion in 2000, and increased to US $1.3 trillion in 2005 (National Endowment for Science, Technology and the Arts (NESTA, UK), 2006).

"Creative industries" is a term for two emerging sectors: the "creative arts" and the "culture industry" (Hartley, 2005). "Creative Industries" are industries that produce tangible goods and intangible services that embody creative content, economic value, and market objectives (UNCTAD, 2008). The creative forces in creative industries are at the center of transforming culture and adaptations for commercialized applications. Creative industries differ from traditional industries. They are similar to tertiary industries (service industries) but include several additional elements. Creative products can transcend the boundaries of traditional concepts of industries, meaning primary industries such as mining; secondary industries, such as manufacturing; and tertiary industries, such as service industries (Hartley, 2005). Workers in creative industry can also be users, and vice versa. Knowledge production and creation concern commercial benefits that transform creative applications into profitable products. Creative industries are defined using concepts that are themselves difficult to define.

A United Nations report defined creative industries as follows:

> Creative industries can be defined as the cycles of creation, production and distribution of goods and services that use creativity and intellectual capital as primary inputs. They comprise a set of knowledge-based activities that produce tangible goods and intangible intellectual or artistic services with creative content, economic value and market objectives. (UNCTAD, 2008, p.4)

The Creative economy either emerges from creative industries or serves as the larger content of answering economy concerns for both culture industries and creative industries. The term ‘creative economy’ often refers to the cultural sector, which emphasizes cultural values and influences. Pratt (2009) uses the term “Cultural and Creative Industries” (CCIs) in discussions about policy concerns, and states that creativity is a key feature of cultural industries and creative industries. Therefore, the term “Creative Economy” can be used to cover both issues. The ‘creative economy’ used in this entire dissertation includes, but is not limited to, the broad content of culture industries and creative industries. Creative economies can involve concepts such as creative industry, or culture industry, to refer to terms such as: commercialized creative ideas, valuable innovations, and transformed culture productions to market value products. On the other hand, creative economies can be recognized as being broader in content. This content involves the personal creativity, social relationships, a creative economy-producing process, and a surrounding environment that supports a creative

economy that exceeds the creative economy product itself.

Some perspectives on the creative economy

Analyses of the creative economy are cross-disciplinary and can cross national boundaries. Contemporary creative production as a cross-disciplinary phenomenon often requires cross-disciplinary cooperation, as in the case of culture, media, and marketing. As regards crossing national boundaries, creative economies often require global and local intellectual involvement. This indicates that concepts concerning creative economy are complex in meaning and implications. What follows are thoughts and perspectives regarding creative economies.

Howkins (2001) claimed that the era of creative economy had arrived by the early 2000s. He emphasized that creativity is the new source of innovation for economic growth. He also stated that creative workers differ from traditional industrial workers in that they need flexible work environments and freedom of thought.

Florida (2002) identified the rise of the creative class. He stated that a new social-economic class specializes in creative activities. These employees earn high incomes and significantly influence economic growth. The features of their work production often differ from those of others--depending on their type of work. They may require flexible work schedules and open-minded, cooperative work surroundings in order to encourage creative outcomes. Florida, et al., (2006) stated that universities may play an important role as a

catalyst for innovation in certain economic and social contexts. Universities have the “3 Ts” (technology, talent, and tolerance) needed in order to achieve and contribute to the creative economy (Florida, et al., 2006).

Landry (2008) examined creativity in the context of a city. His perspective is that the cross-cultural aspects and interactive cultures within a city can help provide creative environments. Different cultures and types of people interact to offer innovations that promote urban development. Wood and Landry (2008) stated that interactive cultures within a city encourage openness and freedom, which in turn encourage creative environments that promote city growth. This growth includes increasing economic and cultural products, in addition to attracting other people to gravitate toward an urban environment.

Peters and Besley (2009) examined creative economies and academic entrepreneurship. Creative economies and education are ethical and social culture issues (Peters & Besley, 2009). Networking and social infrastructures have been influenced by creative economic concepts of collective intelligence. Benkler (2006) used the term ”social production,” while Peters and Besley (2006) used “culture production” to refer to the new paradigm of creative economies. Creative economies value innovation and influence the culture of knowledge production. Knowledge production is not hierarchical, but rather involves social networking.

Creativity and ecological influences

The rise of the creative economy era is tied to recent ecological changes in technology, open social networking, and respect of knowledge. Two concepts encourage creative economy ideas and practices. One is "openness," that is, ideas develop most readily within the context of openness and freedom. The other concept is new communication technologies, that is, new media such as the Internet.

The idea of openness, which will be discussed later, involves making space available and allotting resources for creative thinking. Creative innovations require an open environment for the purpose of nourishing new ideas, encouraging new thoughts, and obtaining knowledge that can be used for knowledge creation. An open environment makes creativity easier to achieve. Environments that have open-minded culture encourage interactions among people from multiple disciplines and different knowledge backgrounds. This results in encouraging creative activities. New communication technologies make creative knowledge interaction and production more effective. New user-friendly communication technologies improve the efficiency of idea production and interaction among producers of ideas. For example, Web 2.0 offers opportunities for individuals to access knowledge exchange platforms and creativity through the Web.

Traditional creativity emphasizes individual imagination. Jung (1923) claimed that creativity is a type of transformation of mental activities based in the collective unconscious.

Gestalt psychology examines the integration of experiences, including perceptive closure and insights (Busse & Mansfield, 1980). Rogers (1959) stated that the motivation for creativity emerges from individual 'self-actualization.' Maslow (1968) classified three types of creativity: "Primary," "Secondary," and "Integrated," depending on how the creative work is conducted. Guilford (1967) provided the Structure of Intellect (SI) theory, in which creativity is related to fluency, novelty, flexibility, synthesizing ability, analytical ability, or the reorganization or redefinition of extant ideals. Some later researchers stated that creativity was not being carried out on the individual level. Rhodes (1961) stated that the '4p's' (Person, Product, Process, and Place or Press) involved individual intelligence, creative outcomes, and environment. Simonton introduced "Environment Impact Perspectives." Simonton (1977, 1999) used perspectives on environmental impact to investigate interactive relationships between individuals and their surroundings, with a particular emphasis on their influence on creative activities. Gardner (1988, 1993) based on his "Multiple Intelligences" theory on interactive perspectives in order to explain how creativity emerges through interaction. Some scholars use the investment perspective to examine creativity. Individuals have six resources that they can access: intelligence, knowledge, thinking styles, personality, motivation, and environmental context. Individuals use experiences and knowledge to transform information to solve problems, while context also plays an important role (Sternberg, 1985; Sternberg, 2003). Individuals can achieve creativity with proper development. In creative markets, they

can use their creative ideas to “buy low, sell high” to make profits (Sternberg & Lubart, 1995; Sternberg, O’Hara, & Lubart, 1997).

Lowenfeld and Brittain (1987) claimed that student-teacher interaction is more important than open classroom structures for encouraging creative thinking. Creativity requires certain types of environments, and an ‘anything goes’ atmosphere may be as negative as an authoritarian atmosphere (Lowenfeld & Brittain, 1987). Empirical evidence supports the idea that “openness to experience” is related to creativity (Prabhu, Sutton, & Sauser, 2008; Peters, 2010a.). On the individual level, open personalities tend to be willing to accept diversity and new ideas, and this may promote creativity (Prabhu, et al., 2008). On the broader social level, creativity requires some form of cultural environment. Florida (2002) stated that creativity involves both technological innovation or a new economic model, and a way of thinking so that those creative habits can be cultivated in individual and social environments. Individual and social environments need to be interactive and cooperative in order to promote social creativity (Fisher and Giaccardi, 2007; Peters, 2010a.). The environment is the organizational context for individual activities. The organizational perspective is that such entities need to provide open environments that users can modify when they use technical and social means to empower participants to develop new thoughts and engage in self-organization (Fisher and Giaccardi, 2007).

New communication technologies make creative knowledge interaction among people

and knowledge production more effective. Information technology supports art and design in creative practice (The National Academy of the Sciences, 2003). Shneiderman (2007) and Peters (2010a.) stated that 'creative supporting tools,' that is, communication technologies, helps users use and search for information and discover and create innovation. The openness concept plays an important role in creative innovations. Open source is a concept that offers users free access to computer program codes and enables the development of new programs and functions. Allowing users to access the source codes of computer programs has improved the sharing process and thereby has shifted notions of intellectual property toward the distribution of intellectual property without exclusionary perspectives (Tippett, 2007; Weber, 2004; Peters, 2010a.). New communication technologies allow individuals to share ideas and participate in collective knowledge production. Peters (2007a.) claims that freedom of information has three aspects: freedom of expression, of code, and of infrastructure. These freedoms influence social culture. Communication technology allows the culture of the participants to lead to collective networking, which involves user participation, interaction and taking active roles in processes (Burgess, 2007; Peters, 2010a.). Benkler (2006) also claimed that contemporary information environments offer individuals the freedom to take action and construct public cultures.

One recent development in communication technology is Cloud computing. Cloud computing allows individuals to become involved in obtaining information by means of

interactive collective knowledge creation. Cloud computing practices involve using Web systems to provide services and opportunities for interaction. Reese (2009) identified three types of cloud service criteria: service access via web browser or web service's application programming interface (API); no initial upfront expenditures; pay only for what one uses. Cloud computing involves software services, platform services and infrastructure services. Software as a Service (SaaS) refers to web-based software service available through a web site with minimal IT demands. Payment is based on usage (Reese, 2009). Platform as a Service (PaaS) refers to programmers and possibly some users, who contribute to program development through the web and conduct services applications (Reese, 2009). Infrastructure as a Service (IaaS) involves supporting services for IT infrastructures and virtualized hardware services (Reese, 2009). Easier access to web data and services allows for user-friendliness and efficiency for business corporations, organizations, educational institutions, and individuals. Cloud computing makes it is easier for individuals to access existing information. New knowledge based on existing information can be created and distributed through interactive environments that make use of Cloud computing.

The creative economy can encourage open environments and develop technological improvements. On one hand, ecological conditions can encourage creative economy to flourish and develop. Openness and communication technologies can promote the development of creative economy. In addition, creative economy can encourage the

development of openness cultures and the improvement of communication technologies that will address economic needs.

Short Summary

The discussions above show that certain concepts are intrinsic to the term "creative economy." Several perspectives can be used to analyze different aspects of creative economies. Creative economies require certain types of environments. Interactions between creative economies and their environments require open environments and communication technology. The United Nations Conference on Trade and Development's (UNCTAD) *Creative Economy Report* (2008; 2010) refers to the creative economy as involving a set of knowledge-based economic activities that have cultural value and cross boundary linkages to the overall economy. This UNCTAD's *Creative Economy Report* (2008) summarizes the creative economy as follows (p. 4):

1. The creative economy is an evolving concept based on creative assets potentially generating economic growth and development
2. It can foster income generation, job creation and export earnings while promoting social inclusion, cultural diversity and human development
3. It embraces economic, cultural and social aspects interacting with technology, intellectual property and tourism objectives
4. It is a set of knowledge-based economic activities with a development dimension

5. It has cross-cutting linkages at macro and micro levels to the overall economy
6. It is a feasible development option calling for innovative multidisciplinary policy responses and inter-ministerial action
7. At the heart of the creative economy are the creative industries

The creative economy is based on the knowledge economy, which integrates culture, openness, creativity and knowledge production in order to benefit economic growth. The creative economy encourages openness, creativity and collective intelligence. Collaborative creativity and an open culture of creative economy can thus encourage open knowledge production. The era of creative economy combines culture, knowledge, and economic development, and is becoming increasingly influential in modern society.

Creative Economy and Policies

The creative economy is involved with cultural and creative industry policy issues. The content, challenges and policy influences related to such issues contribute to the development of creative economies and open education. This section will examine the cultural and creative industries that serve as the foundation for policy discourses. Some policies and their changes serve as examples of how different countries promote creative economy. As regards higher education, it is essential to understand the role higher education might play and the interactive influences it might face.

Cultural industries and creative industries are terms some consider to have

overlapping meanings. An UNCTAD (2008) report defined the two terms in different ways. (The creative economy is based on knowledge of economic activities, and "culture value" as linking to the overall economy, while creative industries focus on goods and services that have market value) The core meaning of cultural industries and creative industries (or the creative economy) involves similar values, namely those that are cultural, creative, innovative and market-oriented. They have overlapping meanings. Some researchers have adopted Cultural and Creative Industries (CCIs) (Pratt, 2009). This dissertation uses the term "creative economy" to include both terms.

Entrepreneurship influence

The creative economy uses the post-industrial business model to emphasize knowledge production rather than material production. One challenge that entrepreneurs face in creative economies involves concerns about balancing finance, art, and self-development (B.Ó . Cinnéid & C. Henry, 2007). Creative economies have post-modern and post-industrial features that entrepreneurial activities develop from old-economy activities, and which emphasize cultural attraction, creative production, and value-added innovation, while deemphasizing manufacturing and mechanization (Rae, 2007).

The changing cultural and creative policies

Cultural policies are important. First, cultural preferences facilitate national identity (Miller & Yúdice, 2002). Second, the economic concerns of creative economies can influence

policy concerns. Cultural creative policies often reflect government preferences regarding national culture and identity. Such policies can shape the tastes of citizens and their social lives. The economy is another key element that encourages governments and the public to think about policies. Cultural creative policies are important for creative economies, and attract the attention of government leaders.

The cultural policies development

The cultural policies of the post- World War II era included various industries and different ways of funding cultural activities in countries such as France and the United Kingdom (UK) (Hesmondhalgh, 2007). The UK gave priority to funding the 'fine arts' and extended a lower priority to traditional arts during the 1970s. The 'community arts' movement of the 1970s was followed by multiculturalism in the 1980s (Hesmondhalgh, 2007). During the 1980s and 1990s, Jack Lang, Minister of Culture in France, promoted policies that included different forms of culture (Hesmondhalgh, 2007). From 1983 to 1986, the left-wing Greater London Council (GLC) argued against elitist forms of art, and some of their members argued in favor of the inclusion of commercial art because they recognized the influence of commercial art in modern culture (Hesmondhalgh, 2007). The policy strategy of the GLC involved investing in cultural industries as a way of regenerating the economy, and since the late 1980s their actions later influenced the policies of other governments around the world, (Hesmondhalgh, 2007). During the late 1980s and 1990s, governments initiated

cultural policies to encourage investments in local popular cultural industries. This involved the GLC's anti-elitist perspective, neoliberalism, and the desire to break the grip of the cultural hierarchy (Hesmondhalgh, 2007). Cultural polices also influence local economic development and social life. Cultural industries can combine regional cultures and encourage small, struggling local art and culture enterprises through funding. However, entrepreneurial activities in the private and public sectors also face many challenges. Some policies reduce social exclusion while others may become ineffective, as in the case of local cultural industries (Hesmondhalgh, 2007).

In the 1990s, "creative cities" and "creative clusters" attracted the attention of policy-makers (Hesmondhalgh, 2007). Landry (2008) stated that using knowledge to promote innovation and creativity can help regenerate cities that are willing to accept urban planning policies. As regards "creative clusters," they influence local policy due to innovation entrepreneurialism in business clusters, which is one reason why the new economy is receiving increasing attention from managers and government (Hesmondhalgh, 2007). The cultural industry has also produced new jobs and new forms of labor through links to the knowledge economy (Pratt, 2009). Pratt (2009) states that these policies work as instruments of social cohesion, help promote social cohesion, and also encourage urban renewal. Pratt (2009) wrote that using the term "cultural industries" in policies is preferable to using "creative industries." Bell (1973) claimed that creativity is the core advantage of

post-industrial society, and the tourism and entertainment industries have adapted creativity for use in their industries.

These cultural and creative industrial policies have been internationally popular for various reasons. The popularity of creative economies results from recognition of the value of popular and folk culture, and economic concerns by virtue of encouraging value-added businesses. This form of business provides benefits for the regeneration of an economy on the local or national scale. Some countries have developed strategies to react to, or join, the rising tide of creative economies in order to increase economic competition. The following section will examine how some countries have developed creative economy policies.

Examples of cultural and creative economy policies

Many countries have developed policies and strategies to promote creative economies. Examples of countries that put effort into developing creative economies can certainly be found. These examples of creative economy policies provide perspectives regarding the manner in which policy-makers develop policies and offer an overall picture of their performance.

The UK provides an early example of how nations can develop creative economy policies. During the late 1990s, the British Department of Culture, Media, and Sports (DCMS) released a report entitled, *Creative Industries Mapping Documents,* to emphasize the importance of creative economy (DCMS, 2001). British creative industries had 2000

revenues totaling £112.5 billion, and employed 1.9 million workers, adding 8% value to the British economy, and enjoying 6% annual growth from 1997 to 2003, average 2005-2007 grow 1.3% in creative industry (DCMS, 2001; DCMS, 2007[2]; DTI, 2005[3]). The British government used the *Cox Review* (2005) to determine the potential value of adapting creative industries' policies for use in other industries. A recent study showed that creative industries accounted for 6.2% of Gross Value Added (GVA) and grew 5% between 1997 and 2007 (by comparison, the entire economy had only 3% growth) (DCMS, 2011[4]; Fraser, 2011). By 2008, creative industries accounted for 5.6% of GVA, and software & electronic publishing industries accounted for the greatest portion of GVA (DCMS, 2010[5]).

Japan has creative industries policies that fall into two main categories. The first category includes media and content governed by the Ministry of Economy, Trade, and Industry (METI). The second category is governed by the Agency for Cultural Affairs (ACA) and includes arts and culture (Hui, 2007). The METI focuses on equal relationships between creators and distributors in addition to establishing a good interactive environment (Hui, 2007). The ACA began making efforts earlier than the METI in seeking to preserve and

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[2] DCMS, 2007, Retrieved from: http://www.culture.gov.uk/images/publications/productivityoftheCTLI_statrelese.pdf

[3] DIT 2005 report. Retrieved from: http://www.official-documents.gov.uk/document/cm65/6536/6536.pdf

[4] DCMS, 2011. Retrieved from: http://www.berr.gov.uk/assets/biscore/enterprise/docs/a/11-899-access-to-finance-for-creative-industry-businesses-appendix-1.pdf

[5] DCMS, 2010. Retrieved from: http://www.culture.gov.uk/images/research/CIEE_Headline-Findings_Dec2010.pdf

promote cultural properties and traditional arts. The ACA increased its budget in order to promote art activities and fellowships for artists both internationally and domestically, while others experienced budget cuts (Hui, 2007).

South Korea launched *The Culture and Arts Promotion Act* in the 1970s (Yim, 2002). The economic growth and highly commercialized society of Korea in the 1980s led the government to seek out culture and art while increasing spiritual development in an attempt to solve social problems (Yim, 2002). The Korean Ministry of Culture and Tourism (MCT, later became MCST[6]) was established in 1998 and was responsible for cultural policies. Several policies and documents were introduced to promote creative economies. Yim (2002) stated that these included the Cultural Industry Promotion Law, the Cultural Industry Promotion Act in 1999, *Content Korea Vision21* in 2000, and *Cultural Contents Industry Vision 21* in 2002. Local governments were involved in promoting local cultural activities and infrastructures during the mid-1990s (Hui, 2007). The Cultural Industry Policy Department of the Korea Culture and Tourism Policy Institute refers to cultural industries as knowledge-intensive, because they combine technologies that are linked to the government's goals of developing a digital technological society (Hui, 2007). The cultural policies of South Korea contribute to economic development and contribute to the cultural identity of Korean citizens (Yim, 2002).

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[6] MCST website: http://www.mcst.go.kr/english/index.jsp

The government of Singapore's Economic Committee identified "cultural and entertainment services" as potential contributors to economic growth during the 1985 economic recession (Hui, 2007). The *Report of the Advisory Council on Culture and the Arts* (ACCA, 1989) influenced the Singapore government to establish agencies and infrastructures to support artistic and cultural activities (Hui, 2007). The Ministry of Information and the Arts (MITA) (renamed in 2004 as the Ministry of Information, Communication and the Arts, MICA[7]) produced the *Renaissance City Report* in 2000 because the Singapore government sought to promote Singapore's cultural and artistic activities (Hui, 2007). The MITA released a Green Paper in 2002 that pointed out the importance of "cultural capital" and the "software" parts of the creative economy related to education and human resources, which differed from some other countries' polices as emphasizing education aspect (Hui, 2007). The creative cluster contributed 2.8% to GDP in 2000, or S$ 4.8 billion (Hui, 2007). Gross R&D expenditures increased from S$3.0 billion in 2000 to S$4.6 billion in 2005 (Lai, 2007, p.1), and grew to about S$6 billion by 2009 (Department of Statistics, Singapore, 2011[8]).

The Centre for Cultural Policy Research at the University of Hong Kong reported on Hong Kong's creative industries in 2003[9] (Hui, 2007). This report classified creative industries as being part of a Creative Index produced by The Home Affairs Bureau of the

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[7] MICA website: http://www.mica.gov.sg/

[8] Statistic data retrieved from: http://www.singstat.gov.sg/pubn/reference/yos11/contents.pdf

[9] Report retrieved from: http://www.cpu.gov.hk/tc/documents/new/press/baseline%20study(chi).pdf

HKSAR government (Hui, 2007). Creative industries were estimated to contribute 3.8% of GDP, or HK $46 billion in 2001 (Hui, 2007).

Taiwan uses the Promoting Integrated Community Development program to enrich local culture and art in seeking to balance economic development between urban and rural areas in the mid-1990s. Taiwan imitated Japan's experience with revitalizing local traditional cultures and art and crafts businesses (Hui, 2007). *The Challenge 2008 Report — the Six-year National development plan 2002-2007* published in 2002 confirmed the need to increase creativity and confirmed that talented citizens transformed Taiwan into a "green silicon island." The Taiwan Institute of Economic Research (TIER), which was established in 1976, in 2003 released a report entitled, 'Cultural and creative industries research and estimate report[10]' to clarify which industries could be categorized as creative industries.

Taiwan Culture Indicators (TWCI) was reformed and released in 2004 by the Taiwan Cultural and Art Institute, as was developed for use as a tool by Taiwanese industries to analyze creative economies[11]. The Executive Yuan's (2009) *Creative Taiwan — Cultural Creative Development Project Action Plan (2009-2013[12]),* followed the *Challenge 2008 Report,* and stated that the average GDP growth from 2002 to 2007 in creative economies was 7.78% higher than average overall GDP growth (3.7%) for the economy as a whole. In

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[10] Taiwan Cultural and Creative Industries Research and Estimate Report:http://www.cci.org.tw/cci/upload/market/20100803072559-c9bd2aea9c743ee952356800c1da1c3f.pdf

[11] Taiwan Cultural and Art Institute website: http://www.cci.org.tw/cci/cci/market_detail.php?c=193&sn=3753

[12] Cultural Creative Development Project Action Plan: http://www.ey.gov.tw/public/Data/912816311971.pdf

2002, the revenue of the creative economy in Taiwan was NT $435 billion, and this increased to NT$ 632.9 billion in 2007. The number of workers employed in the Taiwanese creative economy increased from 162,400 in 2002 to 211,600 in 2007.

An examination of cultural creative policies shows that many policies were transformed in the 1990s to include additional relevant industries and emphasize economic contributions. However, not all creative economy policies have ensured the development of cultural creative industries, nor have they necessarily obtained benefits from such industries.

Open Education and its Applications

Open education is another issue that will be discussed in this dissertation. Open education can serve as the critical connection between education and the creative economy. The development of open education provides educational resources and is a practical means of putting openness concepts into operation. This has influenced knowledge production and the social culture's attitude toward the openness perspective.

Concept of openness

Open education is committed to openness in knowledge learning and educational opportunities. Open science also transforms open concepts into scientific research and interactive relationships. Open education began in the 20th century, may be a result of Enlightenment traditions because it is critical of esoteric educational systems. Open education may be regarded as the "open system perspective" of education and knowledge systems.

Marion (1999) stated that open systems have features such as being holistic and interactive, and are cybernetic in nature when they adjust to feedback. Open system perspectives create or cross boundaries, which in turn results in interactive relationships among systems, and are open to relationships with other systems. "Open system" describes some of the important features of open education. An open system can be analyzed from a nonlinear systematical perspective that involves internal activities, the external environment, and the influences of feedback. Open system theory claims that external factors influence internal activities to a greater degree than internal factors (Marion, 1999). In open education, knowledge construction is open and includes cross-disciplinary participants. Knowledge systems are no longer esoteric and limited to remaining within restricted institutions or individuals, and are now open to collective contributions from participants from different disciplines. Feedback from external sources plays an important role in constructing knowledge.

Lyotard (1984) used the term "metanarrative" to describe contemporary Western ideology and thus provided a critical approach for analyzing this ideology. His book, *The Postmodern Condition*, analyzes contemporary scientific research using broad social and postindustrial aspects. Lyotard used the term "postmodern condition" to describe knowledge and the problem of legitimization in developed societies. He questions grand narratives, particularly Enlightenment metanarratives that dominate the knowledge system that pertains to "meaning" and "truth." These narratives are the foundation of modern science and society,

and are in crises of transformation. A single grand narrative is being replaced by various interpretations. Lyotard (1984) claimed that the postmodern age has multiple representations of knowledge. This has led to more open perspectives and legitimization of knowledge. Open science is the feature of a modern science that provides cross-disciplinary and open boundaries for researchers. Global cooperation and networking have become the common culture for many contemporary research studies.

Open education

Open education is a form of knowledge learning that contributes to open knowledge production. The idea of open education has been developing since the early 20th century. This section will examine the concepts and practices of open education. Open education practices date to the 1960s in Britain and the U.S. Both countries provided education for increased numbers of students through the introduction of flexible forms of education for different types of individuals in order to achieve educational equality (Hill, 1975). The concept of open education has become associated in recent years with distance education, a form of education that uses communication technologies to ensure that open education resources are made available to all individuals regardless of location (Peters, 2008b.). Education equality values stipulate that open education can now be provided for increasing numbers of individuals, due to improvements in communication technologies. The following section will examine certain concepts of openness and open education, and will then examine

its practical applications.

Theories of Openness

This section will examine the theoretical aspects of open education, including concepts of openness, openness that is related to education, and cyber culture. The primary discussions will concern the philosophy of openness, concepts of openness, and open education.

Open philosophy and concepts

Openness involves scientific and political values. Peters and Britez (2008) claimed that open education involves commitments of openness and freedom that are derived partially from historical and political frameworks and beliefs about educational modernization that developed during and after the Enlightenment. Below are some philosophical ideas that involve science, economics, and social and political aspects related to concepts of openness.

Bergson (1935) argued that static religion consists of "closed morality" and that dynamic religion consists of "open morality." He stated that the latter is universal and based on 'creative emotions' which create representations of subjects (Peters, 2009a.). Peters (2009a.) claims that Bergson takes issue with Kant while arguing that the categorical imperative is only applicable in closed societies that are primarily concerned with social cohesion.

Popper (1945) asserted that open societies defend liberal democratic societies from

socialism (mostly fascism). *The Open Society* attacks the essentialism of conceptual analysis and the logical atomism found in the early works of Wittgenstein and Russell, and offers broader critiques of logical empiricism while providing solutions to the problem of induction (Popper, 1945; Peters, 2009b.). In *The Logic of Scientific Discovery*, Popper (1959) introduced the "open epistemology" that he called "critical rationalism." Critical rationalism is based on what Popper called 'falsification,' which is based on a logical asymmetry between confirming and disconfirming cases or observations, and is pertinent to the testability of theory and experience. Popper's science model and concepts of open society parallel each other. On one hand, a magical, tribal or collectivist society is known as a closed society. On the other hand, a society in which individuals are confronted with personal decisions is known as an open society. Popper's notion of openness, when used in an epistemological manner, may lead to rational societies based on openness to criticism (Peters & Britez, 2008).

Hayek is a defender of open markets and the founder of the Mt. Pelerin Society, which defended 'true' liberal societies as open market societies. The Mt. Pelerin Society[13] declared that the political concepts of liberal societies could surmount the economic and ethical problems of totalitarianism, the structure of the state, the rule of law, and free market functions in order to protect against the misuse of history and promote the creation of an international order that would establish peace and liberty. Hayek's interest into self-ordering

[13] Mt. Pelerin Society website: http://www.montpelerin.org/mpsGoals.cfm

in complex systems led him to study psychology. In his book, *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology* (1952), he argues that the mind has the capacity to react and change in relation to its environment.

Soros, a follower of the Popper-Hayek 'open market society' ideals, gave impetus to the concept of open access, and established the Open Society Foundation[14] in 1984 and the Open Society Institute (OSI) in different countries. The Foundation website states their objectives: "(to) work to build vibrant and tolerant democracies whose governments are accountable to their citizens." To achieve this mission, the Foundation seeks to shape public policies that assure greater fairness in political, legal, and economic systems and safeguard fundamental rights." The foundation was responsible for the highly influential *Budapest Open Access Initiative* and the *Open Society Education Monitoring Initiative.*

Kuhn (1962) classified science as being 'normal' and 'revolutionary' and based upon whether or not it fits within a particular 'paradigm.' Paradigms involve metaphysical assumptions, beliefs, practices, and means. Kuhn's perspective on science is governed by successive paradigms that do not proceed in a rational manner (Peters, 2010b.). Peters (2010c.) made the following claim that Popper's view was cultivated serving as a criticism of ordinary language philosophy and the essentialism of the early Wittgenstein encapsulated for many the prevailing spirit of logical empiricism. That can be viewed as a fundamental

[14] Open Society Foundation: http://www.soros.org/

denotative relationship between scientific "fact-stating" language and the reality in which held to a progressive and cumulative view points of progress in the natural sciences, hence, Kuhn takes Popper's conception to task (Peters, 2010c.).

Wittgenstein (1953) was concerned about the language used in reference to the kind of openness activities he refers to as a "language game" and a "form of life" (or aspects of culture). Wittgenstein's *Philosophy of Investigations* demonstrated that language is not a closed system that follows only logical syntax or meta-logical grammar rules. Wittgenstein's account of rule-following states that the openness of language and text may consist of multiple interpretations and constructs that have different meanings. Wittgenstein emphasized the openness of language, text, and subjects being "open to others" (which involves subjectivity) in critiquing the empirical perspectives of logical-linguistic rules that assert only pure and single meanings relating to words that represent the world (Peters, 2010b.).

Weitz (1956) appealed to Wittgenstein to claim that art is an 'open' concept (also in Peters, 2010b.). Therefore, it is possible to extend the meaning of art to unpredictable and completely fresh new ways of interpretation. In such cases, it is possible to apply the concept of art to new entities or activities that were not originally included in such a concept. Weitz asked whether Dos Passos' *U.S.A.*, Woolf's *To the Lighthouse*, or Joyce's *Finnegan's Wake* are really novels. These works require expanding the concept of what constitutes a 'novel' to cover new types of cases, and the results are dependent upon our decision to extend the

conditions for applying the concept (Peters, 2010c.). Weitz stated:

> "Art," itself, is an open concept. New conditions (cases) have constantly arisen and will undoubtedly constantly arise; new art forms, new movements will emerge, which will demand decisions on the part of those interested, usually professional critics, as to whether the concept will be extended or not...the very expansive, adventurous character of art, its ever-changing changes and novel creations, makes it logically impossible to ensure any defining properties (Weitz, 1956, p. 32).

Wittgenstein provides the opportunity to rethink the nature and diversity of language, particularly the misalignment between words and the world. Wittgenstein has influenced many leading philosophers of science, including Norwood Russell Hanson, Thomas Kuhn, Stephen Toulmin, and Paul Feyerabend (Peters, 2010c.). If observers are influenced by the scheme of concepts, it is impossible to achieve neutral observations of language and the world. Kuhn attacked the autonomy of science, and Wittgenstein's point of view asserted that language is part of culture (Peters, 2009c.). Kuhn's book is contrary to versions of logical empiricism and strongly critical of Popper's view that science is a purely rational process (Preston, 2008; Peters, 2010c.). Peters (20010c.) stated that science is at least as much a matter of shared preferences and group commitments as it is a matter of logical procedures.

There are alternative perspectives, from Nietzsche, to Heidegger, to poststructuralists, and even neoliberalists, that the critiques of structure and rationality lead to increasingly

individualized perspectives. Nietzsche critiqued rationalism and the 19th-century religion of the West, and used the term "will to power" to encourage individuals to avoid being misguided. Heidegger took a similar approach to critiquing industrial societies, and uses the term 'being' to indicate individual awareness of subjectivity. Heidegger encouraged the "Dasein" to become aware and to care for the *self-subjectivity* of being in the world. Both Nietzsche and Heidegger thus promoted the liberation of the subject from the external control of either society or rational scientific power. Lyotard questioned the legitimization of the meta-narratives and criticizes the term "totalizing." Lyotard described "modern" as follows: "to designate any science that legitimates itself with reference to a metadiscourse…making an explicit appeal to some grand narrative, such as the dialectics of the Sprit, the emancipation of the rational or working subject, or the creation of wealth" (Lyotard, 1984: p. xxiii).

Lyotard (1984) said that there are two forms of knowledge, scientific and narrative, and raised the criticism of the grand narrative as a means of questioning the hegemony of knowledge and language. The post-modern perspective is that opening the authorities of knowledge production, and respecting differences, thrust the knowledge system into a state of greater openness. Lyotard challenged Hegel's two meta-narratives--first, the emancipation of humanity, second, the speculative unity of knowledge (Peters, 2001):

Postmodern knowledge is not simply a tool of the authorities; it refines our sensitivity

to differences and reinforces our ability to tolerate the incommensurable. Its principle is not the expert's homology, but the inventor's paralogy. (Lyotard, 1984, p. xxv)

Peters (2010c.) claimed that the contemporary trends of emerging globalization and technology have led to the open science economics era, which refers to the openness and cross boundaries of scientific studies and influences on economic matters. Openness and collaboration encourage the exchange and creation of knowledge. The philosophy of openness can consist of a series of reactions to enlightenment ideas and critiques of closed system perspectives.

Openness and education

Open education is based on the concepts of openness and critiques of closed system perspectives on education. Illich (1971) and Freire (1970) critiqued schools that maintained stable social structures so that the oppressed classes could not be elevated through formal educational systems. Therefore, liberal education and the open freedom of school systems are important issues.

Hill (1975) integrated open education from three aspects: procedural, normative, and revolutionary openness. Procedural openness values individual students and provides what is called "whole person knowledge" based on original cultural values: "…procedural openness emphasizes the enrichment of the student's capacity for autonomous personal choices" (Hill, 1975, p.6). As regards normative openness, proponents "…advocate that the choice of

learning tasks and activities shall be entirely the prerogative of students" (Hill, 1975, p.7). Hill (1975) clarified that normative openness logically implies procedural openness, but gives students the freedom to choose any learning direction. Hill (1975) stated that teachers in conditions of normative openness are more like facilitators, who simply respond to learner needs. Hill (1975) referred to Carl Rogers, a psychologist who transferred his client-centered counseling approach to a form of education that emphasizes self-discovery and self-appropriated learning as significant types of knowledge. Rogers (1969) emphasized interpersonal interactions and personal openness to one's own experiences. Hill (1975) stated that revolutionary openness is related to neo-Marxism: Revolutionary openness produces curriculum choices and learning procedures for members of the oppressed classes, which can lead to social change (Hill, 1975). These three aspects of open education show the various levels of openness and its influences on education.

Additionally, open education can be examined from the educational perspective of open knowledge concepts. As a matter of fact, opening and sharing knowledge can be seen as being part of the culture of technical art development. The ancient technē authors wrote in open forums and shared their writings with others (Long, 2001). By the 15th century, open authorship of works about mechanical arts expanded, and certain traditional occult and secret topics such as alchemy, Neo-Platonic philosophy, Hermeticism, the Kabbalah, and astral magic, also proliferated (Long, 2001). The knowledge open to others in some fields has some

long historical development which will be discussed in Chapter four in the issue of open knowledge.

As to defining open education, Tunnell (1975) stated that open education is a vague term that has overlapping definitions. He (1975, p.16) offered some characteristic rules for open education, which are paraphrased below:

(1) Students can pursue educational activities of their own choosing

(2) Teachers can create environments rich in educational possibilities

(3) Teachers can give students individualized instruction based on what he/she is interested in, but can also to guide the student along educationally worthwhile lines

(4) Teachers should respect students. The following types of behavior constitute respect for the student:

   (a) The student is granted considerable freedom; he/she is, for the most part, is autonomous.

   (b) The student's interests and ideas are considered to be important and he/she receives individual instruction and guidance based on his/her interests.

   (c) There is considerable interaction between teacher and student; they are considered to be equal in some sense.

   (d) Students are rarely commanded; exercising authority is minimized.

   (e) Student feelings must be taken seriously.

Tunnell (1975) stated that teachers in open education contexts may intervene to direct students toward educational activities and away from irrelevant activities, and give students freedom when they are engaged in educationally relevant activities. Student learning is partially structured by their environment, which is in turn constructed by the teacher and the teacher's directives (Tunnell, 1975). Geser (2007, p.2) listed the following characteristics of open education:

1. That access to open content (including metadata) is provided free of charge for educational institutions, content services, and the end-users such as teachers, students, and lifelong learners
2. That content is liberally licensed for re-use in educational activities, free from restrictions to modify, combine, and repurpose the content; consequently, content should ideally be designed for easy re-use, in that open content standards and formats are being employed
3. That educational systems/tools/software is used for purposes for which a source code is available e.g. Open Source software) and that there are open Application Programming Interfaces (open APIs) and authorizations to re-use Web-based services, as well as resources.

Open education adapts concepts of openness, and advanced communication technology becomes available to more individuals. Openness in education leads to inclusive

knowledge learning and production conditions in which more individuals can learn and contribute to knowledge creation.

Democracy and cyber-culture

Open resources and interactive cultures provide a basis for democracy. As technological improvements open information to greater numbers of individuals, they enjoy opportunities to learn about social issues and acquire relevant information. Masuda (1981) stated that information societies may help bring about truly democratic societies. His view is that advanced information technology attracts individuals into participating in social issues. Openness and technology work together to make it possible to fulfill Masuda's vision. When all citizens can access knowledge and public issues, individuals can better understand the problems they deal with and can enter into meaningful social discourses and participate in policy making and decision making. Dewey wrote about the role of democratic education in democracies:

An undesirable society, in other words, is one which internally and externally sets up barriers to free intercourse and communication of experience. A society which makes provision for participation in its good for all its member on equal terms and which secures flexible readjustment of its institutions through interaction of different forms of associated life is in so far democratic. (Dewey, 1916, p. 99)

The open knowledge system of education approximates Dewey's perspectives on

education in a democratic society. Open pedagogy involves open interaction and participation of society being put into practice on the individual level.

Information technology and emerging media also influence modern societies. Turner (2006) claimed that emerging technology is just one of the contemporary innovations for promoting social ideas. Other ideas include an electronic egalitarian polis, and a post-institutional, peer-to-peer marketplace that encourages peer-to-peer collective relationships in a free market. Such social ideas date back to the 1950s and 1960s, when technology was developing rapidly in tandem with the counterculture (Turner, 2006). The counterculture criticized the rationale for the Cold War and the impact of industry on people. Researchers such as Mills (1956), Marcuse (1964), Galbraith (1967) and Roszak (1969) provided critical perspectives on centralized and rationalized societies supported by technological development, which Turner (2006) saw as the counterpoint to the counterculture. That is, technology and media can be used to exert social control over individuals. However, technology and media can also be used to raise the subjective awareness of individuals. This freedom of individuals has expanded in the current age of computers and the Internet. The computer technological era has brought into existence networks that facilitate interactions that provide opportunities for collective knowledge production. “As computer and computer networks have come on-line, scholars have in turn increasingly shown how these technologies have amplified and accelerated the impact of knowledge and information on

production process" (Turner, 2006, p.242).

New relationships among individuals have been established in the new era of technology and media. Peer-to-peer knowledge construction has become possible in online cyber societies. As regards learning by means of information technology--meaning distance learning--the relationships among learners, instructors, and technology are becoming increasingly based on empowering learner-learner relationships. These are relationships that instructors should strive to establish, thereby creating environments in which learners are willing to share and help one another (Levin, 2005). Instructors can empower learners by allowing them freedom of expression and providing meaningful content for them as individuals (Levin, 2005). The proper use of technology is important because technology helps ensure that selected approaches or methods will be embraced by learners (Levin, 2005). Technology has provided new modes of knowledge production and respects teachers (faculty) and students in educational institutions (Gumport & Chun, 2005). Such relationships require that freedom and openness are taken seriously and are used to encourage interactions and the process of knowledge construction.

Application and practice of open education

The practical aspects of open education include applications of openness ideas in education and communication technologies. Peters (2008a.) listed five historical moments in open education: open classrooms, open schooling, the Open University, Open courseware,

and open education. These historical moments also constitute practical applications of ideas about open education. Sociological studies of society, psychological research, and technological developments have transformed ideas about 'openness' ideas into reality.

Open classroom

In the early 20th century, H. Lane, A.S. Neil, and B. Russell established schools that promoted educational freedom and autonomy, and which reflected the influence of the psychological theories of that era (Peters, 2008a.). Homer Lane was influenced by group therapy theories that emphasized shared responsibilities and self-expression, and went on to establish the Little Commonwealth School at Evershot, Dorset, in 1913 (Peters, 2008a.; Lane, 1928). A.S. Neill established the "Summerhill School" in 1921 to implement his ideas about the importance of 'self-development' and learning, which were based on ideas about equity and individual freedom (Peters, 2008a.; Neil, 1960). Illich (1971) called for "de-schooling" as a critique of formal education as being overly unified and disadvantageous to students from low socieconomic backgrounds. Illich critiqued the non-creativeness and inequity of formal schooling (Peters, 2008a.; Illich, 1971). Open classrooms involve freedom of movement, value "play," as well as school settings that were later labeled "informal education" in Britain (Peters, 2008a.). In brief, open classrooms questioned the formal educational system and emphasized the value of individual freedom, autonomy, and creative learning.

Open schooling

Ideas regarding open classrooms that value self-directed activities and creativity in "schools without walls" first emerged in open schooling environments. Open schooling, also known as informal education, was influenced by thinkers such as Rousseau, Pestalozzi, Froebel, and Dewey, who emphasized dialogue, democracy, freedom, and student self-expression—as opposed to authoritarian control (Peters, 2008a.). Studies of relationships among open education, freedom, knowledge, open society and community were conducted in the 1970s (Nyberg, 1975; Peters, 2008a.). Open schooling encourages student self-expression, freedom, democratic interactions and respect for individuals. This form of informal schooling provides alternatives that open up traditional formal schooling structures, processes, dogmatic authority and space (Peters, 2008a.). Self-learning is central to informal education, which means that individuals direct themselves toward learning goals based on their individual interests. The informal education movement is also related to the concepts of adult learning and lifelong learning (Peters, 2008a.).

Open university

Informal education provides alternative forms of education and is linked to the development of adult education, distance education and lifelong learning. In the late 19th century, distance education began providing educational opportunities for children in rural areas. Technological development later provided learning tools such as radios, phonographs, film projectors, and television sets for distance education. In the 1960s the Open University

in the United Kingdom began to extend degree programs to individuals who were unable to attend classes on campus, and this model of technology-based open education made progress (Peters, 2008a.). The Open University uses technology-based distance education to provide educational opportunities for individuals in rural areas that are removed from educational institutions (Peters, 2008a.). The Open University uses the term "open learning" to emphasize individualized learning. The Open University was established in 1969 and became a model for open education that was later adopted by other institutions (Peters, 2008a.). The Open University form of education has become an influential model for several other countries, which later combined open education ideas with local networks (Peters, 2008a.).

Open courseware and resources

The Massachusetts Institute of Technology (MIT) is a pioneer of Open courseware (OCW). MIT announced in 2001 that they intended to form an "OpenCourseWare Consortium[15]" in 2005 and publish all MIT coursework resources online within two years (Peters, 2008a.). The MIT model does not offer degrees but exemplifies the sharing knowledge content model. This model may provide advanced educational opportunities and empower individuals globally. There are other institutions in the open education movement that have made efforts to open courses and resources to greater numbers of individuals.

OCW is considered to be a feature of the 21st century (Peters, 2008a.). MIT is a

[15] MIT OpenCourseWare Consortium: http://ocw.mit.edu/about/ocw-consortium/

pioneering university that has introduced OCW to share coursework resources. The MIT OCW website[16] revealed that their OCW ideas were developed by MIT faculty members who wanted to share knowledge. The OpenCourseWare Consortium[17] became a collaboration of more than 100 higher education institutions and organizations that seek to share educational content and empower individuals around the world. *The Cape Town Open Education Declaration* (2007) stated that the sharing of knowledge on a global basis through the Internet can help bring about revolutionary changes by creating a world in which every individual can access and contribute to the sum of human knowledge. Peters (2008a.) claimed that the open education movement combines certain traditional educators' thoughts about "sharing good ideas" and the Internet's collaborative, interactive culture. This may provide an environment for open and collective knowledge creation.

Open education today

Open education continues to develop by using advanced communication technologies and new ideas. Some projects and reports have promoted open education. These include the OECD's (2007) *Giving Knowledge for Free: The Emergence of Open Educational Resource*[18], the Open e-Learning Content Observatory Services (OLCOS) project, a report entitled *Open Educational Practice and Resources*[19], a report to The William and Flora Hewlett Foundation,

[16] MIT OCW website: http://ocw.mit.edu

[17] OpenCourseWare Organization: http://ocwconsortium.org

[18] OECD(2007), *Giving knowledge*. Retrieved from: http://www.oecd.org/dataoecd/35/7/38654317.pdf

[19] OLCOS project. Retrieved from: http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf

and *A Review of the Open Education Resources(OER) Movement: Achievements, Challenges, and New Opportunities*[20]. They examine ideas about openness and how to couple them with promising new technological tools and provide benefits to education. These reports showed a continuous development of open education in recent years. There are also several terms have been applied to open education, including distance learning, lifelong learning, and continued learning. Open education has the potential to transform ideas about openness into practice. Open education can open learning opportunities to greater numbers of people and provide an environment in which interaction is encouraged, i.e., collective knowledge creation and open knowledge production. New applications of technology have the potential to increase the spread of open education in areas related to knowledge learning and knowledge creation.

Open education is a new paradigm of social production within the global knowledge economy that is based on 'openness' ideas and involves the use of technological tools to achieve innovation and economic development. Four relevant reports, *The Digital Economy and North America Economic Growth* (2001)[21], *Digital Economy: Promoting Competition, Innovation, and Opportunities* (2001)[22], *Promoting Innovation and Economic Growth: The*

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[20] OER movement. Retrieved from: http://www.hewlett.org/uploads/files/Hewlett_OER_report.pdf

[21] *North America economy growth.* Retrieved from: http://www.ced.org/images/library/reports/digital_economy/report_ecom_canada.pdf

[22] *Promoting competition.* Retrieved from http://www.ced.org/images/library/reports/digital_economy/report_ecom.pdf

Special Problem of Digital Intellectual property (2004)[23], and *Open Standard, Open Source, and Open Innovation: Harnessing the Benefits of Openness* (2006)[24], emphasized the importance of intellectual property and peer-to-peer networks as well as their potential influences on economy. Peters (2008b.) stated that 'open innovation' is relevant to economic issues. 'Open innovation' emphasizes collaborative peer production by means of lowered costs and free access to digital information products. This resembles the "open science" movement of the National Institution of Health (NIH) and 'open courseware' because openness leads to innovation and encourages collaborative knowledge production.

Cloud computing also offers efficient technological services and broader applications for open education. Open education can adopt existing cloud computing web services and thereby reduce the cost of infrastructure. Software services in cloud computing are Web-based services that make minimal IT demands, which also lowers costs for users by avoiding the need for high-priced IT equipment. Open education adopted advanced technology, providing various types of learning and supplying knowledge and data without pushing the limits of the capacities and performance of individual personal computers.

Cloud computing also provides the motivation for increasing numbers of applications for open education. The platform is open, which allows educators to operate and reconstruct

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[23] *Innovation and economy growth*. Retrieved from: http://www.ced.org/images/library/reports/digital_economy/report_dcc.pdf

[24] *Open standard*. Retrieved from: http://www.mitpressjournals.org/doi/pdfplus/10.1162/itgg.2006.1.3.119

application services that meet various educational needs. The interactive and approachable web applications support inclusive participation. The interactive user format impels open education to build interactive learning communities.

The practice of open education is a work in progress that incorporates continuous technological improvements. The concept of open education is derived from Enlightenment concepts--such as freedom of knowledge--and educational equality concerns in open education are put into practice through the use of technological tools. However, focusing exclusively upon practical development does not give a complete picture of open education. Open education concepts remain an important source of motivation for future educational development. Ideas of freedom developed during the Enlightenment--political questions, epistemology questions, ontology questions, and ethics questions—are part of the overall picture in open education (Peters, 2008a.). Open education not only provides an openness to education resources and collective knowledge production, but also extends traditional Enlightenment ideas to the present and across the public arena.

Short summary

Open education combined new communication technologies, which is one reason why it has become an important form of education. UNESCO (2002) has developed a definition of open education resources: “The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaption by a

community of users for non-commercial purposes" (p.24). OECD (2007) described open education resources as involving learning content, tools (including software and technology to support learning content, learning management and development systems, and learning communities), and implementation resources (including copyrighted property and other forms of intellectual property).

These descriptions by UNESCO and OECD provide fundamental goals for open education in the sense of providing educational resources that serve the public good. Open education can play an influential role in opening knowledge and learning to greater numbers of individuals. As individuals acquire increasing amounts of knowledge, societies become more open and competitive.

Open Society and Higher Education

Democracy and technology influence modern society toward changing in the direction of becoming a more open society—one in which boundaries shrink and increased access becomes available. The development of an open society also relies on the knowledge capital that citizens provide, and their willingness to share their knowledge by interacting with others. Modern economic development also requires innovations in knowledge. The Committee for Economic Development encourages "open innovation," which is related to peer production and intellectual issues (Peters, 2008a.). An open society needs high-quality citizens who are able to openly interact with others in the knowledge sphere, while also avoiding the abuse of

the freedoms of their fellow citizens.

Higher education plays an important role in open society as an institution instructing citizens and providing critical perspectives on social and political affairs. Open societies that support free and open environments require high self-organized and self-governed citizens. Citizens need to be educated with an adequate knowledge base, the ability to make reasoned moral judgments, communicate effectively, and adopt critical perspectives to achieve a self-governing, participatory open society. The institution of higher education also plays a role as an entity that creates and preserves knowledge as it educates. It also conducts research and provides critical perspectives for society. An open society supports higher education in conducting critical research while promoting a variety of perspectives. An open society and higher education are mutually supportive. The practical influences on developing open society and higher education are the policies and how they are conducted.

Policy concerns in general

There are different definitions of and perspectives about the term "policy." Some references to policy concern government decisions and actions. Dye (1992) argued that policy is what governments choose to do or not do. Hogwood and Gunn (1984) stated that the concepts of policy include a field of activity, expressions for general purposes, specific proposals, government decisions, formal authority, outcomes, and output.

Some references to policies exist in texts and agendas. For example, Ball (1994)

claimed that “Policy is both text and action, words and deeds, it is what is enacted as well as what is intended” (p.10). It has been pointed out that what can be found on written agendas, such as goals and policies, are sometimes not directly related to practices and may result in failure. Agendas have many uses. Kingdon (2011) defined policies as follows: “…the list of subjects or problems to which governmental officials and people outside of government closely associated with those officials, are paying some serious attention at any given time”(p. 3). Considne (1994) claimed that policies are more like recipes than blueprints because of their level of generality. Policy may consist of a general overview of an issue that is open to various interpretations, without any sort of confirmation of results. Policy texts include official documents but are not limited to them. Other intentional expressions on the part of policy makers or official representatives through media may also be influential. Those who execute policy in the field may be as influential as the policy makers as a result of their interpretations of policies (Ozga, 2000; Rizvi & Lingard,2010). Ball (1994) pointed out that there exists a “policy cycle” that provides non-linear perspectives regarding relationships among contexts, setting policy agendas, policy text productions, and implementations.

Some parties emphasize policy over aspects of changes. Weimer and Vining (2004) stated that policy centers on changes. Policy involves searches for changes in contemporary conditions in order to achieve some sort of improvements or solutions. Making changes involves the issue of power relationships. Power interactions and relationships surrounding

policy-making can be influential. Foucault (1980) stated that every form of knowledge is related to power and that power is associated with knowledge. Wedel, *et al.* (2005) stated that the meaning of policy is more important than policy by asking what do people do by using the name of policy. Problems are not self-evident, but are instead created as a result of people holding certain points of view (Dery, 1984). Policies sometimes involve proposing solutions to problems that are the results of the policies themselves (Yeatman, 1990). McLaughlin (2006) claimed that problems are constructed to provide legitimacy for policy proposals. The idea of policy contexts is not objective but is instead constructed using a framework within a particular perspective (Seddon, 1994). Easton (1953) indicated that policy consists of the networking of decisions allocated values. Considine (1994) articulated that public policy as an action employs government authority to support preferred values by committing relevant resources. Birkland (2011) stated policy as statement of what government intend to do. Policy texts are constructed by means of broader discourses (Ball, 2006). Policy analysis should also consider the importance of the historical approach, whereas globalization can influence the policy process. "…policy analysis not only explores the workings of political power and authority, but is also embedded within relations of power" (Rizvi & Lingard, 2010, p.50).

Public policy-making includes the following: setting agendas, alternative choices, authoritative choosing among alternatives, and the implementation of decisions (Kingdon, 2011). Policy studies emerged in democratic countries in the 1950s when governments

adapted social science analytical frameworks to help them develop public policies instead of making instinctive decisions (Rizvi & Lingard, 2010). Governments believed that problems and issues could be solved by knowledge and rational techniques provided by the social sciences. This ‘rational’ perspective includes a number of determined steps; the context of policy analysis; and explaining policy options, such as the selection of policy decisions, outcomes, implementation, and evaluation (Rizvi & Lingard, 2010). At that time, the public believed that government intervention was needed in order to solve social problems and provide equality by implementing the rationalist approach (Rizvi & Lingard, 2010). However, this changed during the 1980s:

> First, it was believed that this approach did not produce the reliable, generalizable and predictable policy knowledge as it had promised. Second, the positivist view of (social) science upon which that rationalist approach was based was increasingly discredited or at least challenged within social sciences. Thirdly, a range of new theoretical developments such as critical theory, feminism, post-structuralism and post-colonialism undermined rationalist approaches and claims to knowledge, and their alleged value neutrality. Fourthly, the Keynesian economic theories upon which many policy interventions were based lost popular support, especially following the ideological assault on them by the Thatcher and Reagan governments. Market ideologies framed by neoliberalism became ascendant around the world. And finally,

> and perhaps most significantly, the emerging process of globalization transformed the political and economic context in which public policies where developed. (Rizvi & Lingard, 2010, p.2)

This shift towards the increasing influence of globalization and market ideologies affected education policies. Educational systems around the world became larger and more complex, governments became increasingly unable or unwilling to fund education for financial reasons, and they eventually turned to the free market in search of solutions. Global neoliberalism influences played an important role in this policy shift, and will be discussed later.

Education policies

Educational policies exhibit policy characteristics and influences derived from social systems and globalization. Luke and Hogan (2006) defined educational policy as follows: "…prescriptive regulation of flows of human resources, discourse and capital across educational systems towards normative social, economic and cultural ends" (p. 171). Educational policy presently also faces influences produced by globalization. Rizvi & Lingard (2010) state that 'globalization' influences theory, methodology and educational policy analysis. Intergovernmental organizations such as the OECD, EU, APEC, UNESCO, and the World Bank play important roles in shaping discourses on globalization and this has implications for educational value, particularly knowledge and global economic perspectives

on education (Rizvi & Lingard, 2010).

It is clear that policies involve complex power relationships and the transformation of intentions that are derived from policy texts. Economic concerns have emerged in the form of policy considerations derived from neoliberalism, globalization, and other influences. These concerns have influenced education policies, particularly in higher education as well as developing open societies.

Higher Education Policies

Higher education policies have been influenced by policy perspectives and globalization, and this has involved changes in educational values and practices. Educational values have been debated for centuries. Some perspectives emphasize education as a form of teaching knowledge and forms of thoughts for the purpose of transmitting culture to individuals. Whitehead (1929) claimed that educational values are based on, and derived from, theoretical assumptions regarding the nature of knowledge and the nature of human beings. Whitehead stated that education means teaching students to go in a certain direction so that they become cultured and knowledgeable. Hirst and Peters (1970) stated that educational value is a knowledge condition of individuals that results from forms and concepts produced in the mind. Education teaches individuals the general forms and concepts of knowledge.

Some argue that education is closely related to social influences and relationships.

Durkheim (1972) indicated that the value of education is the instrumental value that reflects social structure. An educational system is constructed within a particular social system, and the value of education is connected to the social needs that exist within the given social condition. Dewey (1916) declared that the value of education develops within a particular set of surrounding conditions.

As regards higher education, it involves the educational value of teaching knowledge and influencing society. However, the main concern of this dissertation is to focus on those social influences that are related to globalization and neoliberalism. Globalization policies exert a major influence on higher education policies. Phillips and Ochs (2004) noted that the works of IGOs have resulted in policy borrowing, transferring, appropriation, and the copying of ideas across national boundaries. These policies influence economics and higher education. Education, when combined with economic concerns, became more influential during the 1990s when IGOs promoted ideas about knowledge economy. Today's public research universities face challenges as they move from engaging in purely public missions and move toward balancing funding and competing with private institutions in carrying out research (Calhoun, 2011). Policy makers may consider science and research leading to new innovation as providing economic benefits (OECD, 2004) so that research universities may become industrialized and commercialized.

Higher education has been influenced by capitalism and commercialization, and these

may not always be negative influences. Walberg and Bast (2003) stated that the public misunderstands capitalism and argued that proper usage of capitalistic ideas can lead to reforms of the school system by increasing efficiency, competition, freedom, and subject value. Walber and Bast(2003) believe that the proper application of capitalism can serve the cause of justice and equity by clarifying the characteristics and value of education. Higher education can still be critiqued, however, because influences of commercialization must seek a balance among the original research mission, changing public expectations, and the search for profits (Bok, 2003). Higher education may be unable to avoid the clash between neoliberal values and market competition influences, but it is possible to gain profits and still serve the public good.

When the U.S. economy expanded during the post-war era, innovations developed at research universities provided knowledge products and workers (Calhoun, 2011). Universities have served as centers of knowledge production and a means of imparting knowledge to individuals. Knowledge production has been one of the primary functions of higher education. When knowledge was recognized as an important economic innovation, higher education sought to increase the efficiency of its knowledge creation. This perspective is further emphasized by competition within the context of globalization and policy transformations. Some universities changed over to central management in order to replace traditional faculty-governance systems. Some universities narrowed their missions to purely vocational

training. Some universities emphasized research and neglected teaching, and therefore lightened faculty teaching loads to allow them to emphasize research. Some universities began emphasizing the training of Ph.D.s and the production of research (Calhoun, 2011). Fagerberg (2010) used Schumpeter's definition in viewing innovation as a kind of new resource that combines existing knowledge and resources for the purpose of meeting economic and social needs. Innovation and science are similar, but not quite the same--a distinction that policy-makers should keep in mind. Science seeks to expand knowledge, while innovation concerns the utilization of knowledge for practical purposes (Fagerberg, 2010). Higher education traditionally dealt with scientific issues, which concerned the extension of knowledge and research for the purpose of serving the public good. Higher education must now react to policies of global neoliberalism, which include the need to innovate for practical purposes and to serve private interests as well.

Global neoliberalism policies have affected higher education in recent decades. Higher education now fills important role in economic development and had adjusted to this new role. Its traditional role of seeking knowledge now also includes practical market needs. In the era of creative economies and open societies, higher education faces challenges from changes in public expectations and practical restrictions. The public good and private interests may need to be balanced within the context of higher education. Influences on higher education policies are complex and must be recognized.

Chapter 3

Methodological Approaches

This chapter will describe the methodological approaches used in this dissertation. This dissertation uses two primary methodological approaches: interpretation, and quantitative methods. Interpretative research methods are used to understand theories and interpret facts for the purpose of presenting arguments. The quantitative methods used in this dissertation employ a comparison structure (co-plot) and are used to categorize and compare different cases and variables. These methods can help obtain an understanding of the issues and produce supporting data that will help answer research questions.

Interpretative Methods

The interpretative methods used include theory, discourse, and policy analysis. Fairclough (2003) stated that 'language is an irreducible part of social life, dialectically interconnected with other elements of social life…'(p.2). Discourse analysis can help provide an understanding of the social effects through observation of what happens and how people talk or record a social event. Fairclough (2003) claimed that there are two main forms of discourse analysis: first, the linguistic approach, which involves one looking at the linguistic details of texts; second, less attention is given to the form of the texts and more is given to social theory perspectives. The latter type of discourse analysis has highly influenced the work of Foucault (Fairclough, 2003). This dissertation adapts the discourse analysis

perspectives of Fairclough (2003) and Halliday (1994) and follows the System Functional Linguistics (SFL) method, which concerns the relationship between language and social elements. This study will thus analyze the relationship between the discourses of texts and practical social influences.

Discourse analysis examines different discourses related to contemporary creative economies and open education concepts. Discourse analysis also concerns the broader patterns of social economic development that influence such discourses, such as OECD, the World Bank, and UN, which have published documents and held conferences regarding these issues, and whose efforts center on socioeconomic development.

Examining how creative economies and open education policies influence higher education allows this dissertation to report on the results of policy research. One important method of implementing policy research is policy analysis. Majchrzak (1984) claimed that policy analysis examines the policy-making process, including the adoption of policies and their effects. The steps in interpretive policy analysis include:

1. Indentify the artifacts (language, objects, acts) that are significant carriers of meaning for a given policy issue, as perceived by policy-relevant actors and interpretive communities;
2. Identify communities of meaning/interpretation/speech/practice that are relevant to policy issues under analysis;

3. Identify the “discourses,” the meaning being communicated through specific artifacts and their entailments (in thoughts, speech, and actions);
4. Identify the points of conflict and their conceptual sources (affective, cognitive, and/or moral) that reflect different interpretations by different communities (Yanow, 2000, p.22).

Policy analysis in this dissertation may examine the OECD, the World Bank, and UN’s artifacts to obtain a greater understanding of meaning and possibly conflicting critiques. This dissertation focuses on the concepts and interactive relationships among creative economies, open education, and higher education. Therefore, these interpretations and critical perspectives are important because they clarify meaning and construct potential improvements. These interpretations are based on theories and data collected from various texts.

Rational Uses of Comparison Structure

The comparison structure (co-plot) can analyze variables and observations together. The selected countries are examples of the observation approach, while their correlations with different variables categorize countries that have similar characteristics (variables). This method can be used to classify different countries into various groups. It can also be used to reflect the overall performance of different countries. The co-plot technique provides a way to categorize countries with respect to different variables. Classical multivariate analysis

methods, such as Principal Component Analysis, Multidimensional Scaling or Cluster Analysis, involve variables and observations (cases) often being analyzed separately. Other methods, such as the M&B approach and Correspondence Analysis simultaneously analyze variables and observations (cases). The co-plot technique can locate observations in a two-dimensional graph, as determined by all of the variables (criteria) taken together. This is helpful for categorizing observations based on their correlations with different variables. For example, the co-plot method has been applied to an analysis of 1980-1990 computers (Gilady, Spector, and Raveh, 1996), analyze socioeconomic differences among Israeli localities (Lipshits & Raveh, 1998), the performance of the Greek banking system (Raveh, 2000a), a graphical display for Multicriteria Decision Making (MCDM) (Raveh, 2000b.), and tourist attractions and the modeling of tourist cities (Shova & Raveh, 2004).

The co-plot graphical display technique is useful for use with data matrices such as Xn×k: The n points refer to the observations (sample units), and the k arrows refer to the same axis and origin. This is useful for studying a set of data that includes observations and variables. In co-plot maps, similar observations (row of a matrix) are located close together on the map. This signifies that the same group of observations has similar characteristics or types of behavior. Each variable is represented individually, using an arrow as an indicator. The goodness-of-fit (GFI) is separately associated and calculated for all of the criteria. The co-plot is based on two superimposed sequential graphs. The first graph maps n points as

being rows, while the second graph is conditional upon the first graph and consists of k arrows that are individually represented.

The co-plot method integrates the mapping of concepts with variant regression analysis. It begins with a data matrix Xn×k of n rows and k columns. The rows represent observations, and columns represent variables. In the co-plot method there are two preliminary treatments of the data matrix Xn×k and two subsequent stages.

In the first stage, in order to treat variables equally, Xn×k is normalized into Zn×k. The elements of Zn×k are deviations from column means ($\bar{x}_{.j}$), divided by their standard deviations: Zij =(xij - $\bar{x}_{.j}$)/Sj

In the second stage, a measure of dissimilarity, distance $D_{il} \geqq 0$ between each pair of observations (rows of Zn×k) is conducted. A symmetric n×n matrix (D_{il}) is produced from the ($\frac{n}{2}$) different pairs of observations. The sum of the absolute deviations, as a measure of dissimilarity is: $D_{il}=\sum_{j=1}^{k}\left|Z_{ij}-Z_{lj}\right| \geqq 0$, (i$\geqq$1, n$\geqq$1)

In the third stage, the matrix (D_{il}) is mapped using a multidimensional scaling (MDS) method. Observations are thus represented as n points P_i=1,…,n in a Euclidean space (of say, m=2 dimensions). Guttman's Smallest Space Analysis (SSA) has been chosen to provide a graphic representation of the pair-wise interrelationships of a set of objects (Guttman, 1968). SSA uses the coefficient of alienation y as a measure of GFI. In short, as regards a two-dimensional space, this stage gives 2n coordinates (X_{1i}, X_{2i})i= 1,…,n; in which each row

Z= Z_{i1}…Z_{ik}) is mapped onto a point in a two-dimensional space (X_{1i} X_{2i}).

In the fourth stage, k arrows ($\bar{X}_j$, j=1,…, K) are drawn on the Euclidean space obtained in the third stage. Each variable j is represented by an arrow $\bar{X}_j$ emerging from the center of gravity of the point Pi. Each arrow $\bar{X}_j$ is chosen to obtain the maximal correlation between the actual values of variable j and its projections on the arrow. In such cases, arrows with highly correlated criteria point in a generally similar direction. This also leads to the cosines of angles between these arrows being approximately proportional to the correlations among their associated criteria.

The goodness-of-fit of a co-plot is assessed using two types of measurements, for Stage 3 and Stage 4. In Stage 3, a general single coefficient of the goodness-of-fit for the configuration is obtained by using MDS. As regards the SSA method, the coefficient of alienation y is used. In Stage 4, k each individual measurement is obtained for each of the k variables separately. These are the magnitudes of the k maximal correlations, r_j^*; j=1,…,k that measure the goodness-of-fit of the k regressions. The correlations, particularly the goodness-of-fit, can be helpful in deciding whether or not to eliminate (or add) variables. Variables that do not fit with the graphical display--that is, those that have low r_j^*, should be eliminated. The higher the correlationr_j^*; the better $\bar{X}_j$ represents the common direction and order of the projections of the n points along the rotated axis $\bar{X}_j$ (arrow j). Fourteen ordinal variables were chosen for the analysis, and will described in the next section.

In short, the co-plot used in this dissertation is intended to conduct the overview of how creative economies and open education aspects of selected countries perform. The selected countries entail the observations made using the 14 variables to categorize the characteristics of countries. Countries that have similar characteristics (correlations of variables) are grouped together. The arrows represent different variables, and when each observer is perpendicular to the arrows, that observer reflects its correlation with the variable. This comparison structure outcome can provide an overview of global regional performance in creative economies and open education.

Justification of Case Selection and KAM

The observation samples of this dissertation are selected based on their creative economies and the development of open education in their region. This sample selection process is restricted by the data provided by the World Bank's KAM (Knowledge Assessment Methodology) data. The countries were selected based on their performance and are representative of their regions. Some countries were selected on the basis of examples taken from literature, specifically, being deemed creative cities (Landry, 2008).

In the European region, the UK, France, Italy, Germany, Norway, Finland, and Russia were chosen. In the Asian region, Taiwan, Singapore, Japan, Korea, China, and Hong Kong (China) were chosen. In other regions, the USA, Canada, Austria, New Zealand, and Brazil were chosen. These samples represent the performance and characteristics that are

representative of each region with respect to creative economies and aspects of open education. In addition, simply because certain countries were not selected does not mean that they are less developed with regard to creativity or openness. However, the countries that were chosen were selected because they either had highly developed creative economies or exhibited economic growth in their respective region.

Explanations and meanings of variables

According to the Knowledge Assessment Methodology (KAM) website[25],

> The KAM is an interactive benchmarking tool created by the Knowledge for Development Program to help countries identify the challenges and opportunities they face in making the transition to the knowledge-based economy.
>
> The KAM consists of 109 structural and qualitative variables for 146 countries to measure their performance on the 4 Knowledge Economy (KE) pillars: Economic Incentive and Institutional Regime, Education, Innovation, and Information and Communications Technologies. Variables are normalized on a scale of 0 to 10 relative to other countries in the comparison group. The KAM also derives a country's overall Knowledge Economy Index (KEI) and Knowledge Index (KI).
>
> The Variables in KAM represent the broad performance of knowledge economies[26].

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[25] Knowledge Assessment Methodology (KAM) website:, retrieved from: http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/EXTUNIKAM/0,,contentMDK:20584250~pagePK:64168427~piPK:64168435~theSitePK:1414721,00.html

Some of these variables are positively related to creative economies and open education(which will be further explained in later section). With this dataset one can examine the overall performance of the four pillars of the Knowledge Economy framework, which is in turn divided into eight functional areas：

1. Overall performance of the economy
2. Economic incentives and institutional regime
   (1) Economic Regime
   (2) Governance
3. Innovation system
4. Education and human resources
   (1) Education (includes labor as a sub-section)
   (2) Gender
5. Information and Communication Technology (ICT)

Working with a large set (109) of variables can be unwieldy, so it was necessary to develop a simplified Basic Scorecard. This 14-variable scorecard attempts to capture a given country's preparedness for a knowledge-based economy and is used to calculate its overall Knowledge Index (KI) and Knowledge Economy (KEI) Indexes. These variables are

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[26] KAM and the knowledge economy, retrieved from: http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/EXTUNIKAM/0,,contentMDK:20584288~menuPK:1433258~pagePK:64168445~piPK:64168309~theSitePK:1414721,00.html

correlated in relation to creative economies and open education due to the interactive relationships among economics, creativity, and open education. Creative economies transform knowledge and creativity into economic growth. Intellectual property and production are important aspects of creative economies, which may be related to (and not simply limited to) “patents,” “journal articles,” “copyright laws,’ and “royalty payments.” On the other hand, open education relates to the fields of education and telecommunication technology, which are associated with “educational enrollment,” “adult literacy,” “telephones,” “computers,” and “Internet development.” “Human development index” (HDI) and “GDP” can be seen as providing an overview of economic development. In addition, “University-Company Research Collaboration,” “Internet Access in Schools,” and “Brain Drain” are variables that all concern higher education’s relationship with creative economy and open education. Therefore, these variables are placed into analysis. The detailed analysis will be explained further in Chapter Four. These principle fourteen variables chosen for the final statistical analysis from the World Bank’s suggestion provide general understanding of knowledge economy performance. If reliable data for an indicated year was not available, the closest available year was used. The details of each variable definition can be found in Appendix I, which is mirrored by the World Bank website. The next chapter will use, for further analysis, the co-plot technique, observations of selected countries, and other assorted variables.

Chapter 4

KAM Data Analysis and Reflections

This chapter has two major sections. The first section concerns using KAM data together with the co-plot method analysis to observe differences in characteristics in different countries and regions. The second section critiques these issues.

KAM Analysis

The co-plot method transforms KAM data so that it can be displayed and classified based on the differing strengths of the variables and their correlations. This form of analysis also provides visual pictures that make it easier to understand the differences that exist among different countries and regions. This section uses the co-plot method to examine selected countries in Europe, East Asia, the USA and Oceania, and examines performance in certain regions. It does not include all of the KAM data, but does provide meaningful displays for future analysis. The selection of the subjects are mostly based on the findings of the studies by Landry(2008), Tschang(2009), Hui(2007), Aggestam(2007), Moss(2007), and Mok(2007). Some countries are also selected based on their creative economy performances or on their locations and economy potential.

The variables were selected based on their relationships to open education and creative economies. The measurements were made by Florida, et al. (2010), and examined universities' creative economies based on certain aspects of technology, tolerance, and talent.

These variables include technology, patents and human capital. The KAM includes numerous variables in its data. This dissertation selected only ten of these variables. The World Bank KAM classifications state that these variables represent overall economies, economic regimes, innovation, education, labor, and communication technologies. The first part of each co-plot was made using the basic fourteen variables the World Bank recommended, together with the original actual numbers. The "Annual GDP Growth (%)" and "Human Development (HDI)" represent the overall socioeconomic status of a country. "Tariff and Non-Tariff Barriers" indicates the economic regime and freedom of trade. "Regulatory Quality" and "Rule of Law" relate to government operations. As regards innovation, this study used "Royalty payments and receipts," "S&E journal articles per millions of people," "Patents granted by USPTO per millions of people" and "University-company research collaboration." As regards the education area, this study used "Adult literacy rate (% age 15 and above)," "Gross secondary enrollment rate," and "Gross tertiary enrollment rate" variables. "Total telephones per 1000 people," "Computers per 1000 people," "Internet users per 1000 people" were variables that referred to the area of information and communication technology. The variables are transformed to abbreviations in co-plot figures for clearness. The abbreviations are: GDP representing "Annual GDP Growth (%)," HDI representing "Human Development Index," T&NB representing "Tariff & Nontariff Barriers," RQ representing "Regulatory Quality," RL representing "Rule of Law," RPR representing "Royalty Payments and

Receipts(US$/pop.),” S&E representing “S&E Journal Articles / Million People,” PG representing “Patents Granted by USPTO / Million People,” ALR representing “Adult Literacy Rate (% age 15 and above),” GSE representing “Gross Secondary Enrollment rate,” GTE representing “Gross Tertiary Enrollment rate,” TEL representing “Total Telephones per 1000 People,” CP representing “Computers per 1000 People,” NET representing “Internet Users per 1000 People,” URC representing “University-Company Research Collaboration (1-7)(in 2008),” NetS representing “Internet Access in Schools (1-7) (in 2008),” and BD representing “Brain Drain (1-7)(in 2008).” The first co-plot used the actual numbers to provide insights into how countries actual perform.

The second co-plot uses normalized numbers[27], which may help reduce the influence of extreme numbers and improve the comparisons process. The normalized data is also from the World Bank data. As regards focusing on creative economies and university education, the university-company cooperation variable was added to replace royalty payments. The secondary enrollment rate was also temporarily put aside to focus on higher education. As regards open education, Internet access in schools was used to replace the variable concerning phone and computer usage per 1000 people. “Brain Drain” reflects the mobile intellectual human resources of a country. The details and definitions of the variables are

[27] Normalized procedure of KAM, retrieved from: http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/EXTUNIKAM/0,,contentMDK:20584281~menuPK:1433234~pagePK:64168445~piPK:64168309~theSitePK:1414721,00.html

provided in Appendix I.

Europe

Many European countries have been developing their cultural and creative industries for decades. Countries were selected for analysis based on their regions in Europe and their degree of economic development, as follows: Finland and Norway represent northern Europe; Western Europe is represented by France, the United Kingdom (UK) and Germany; Italy represents southern Europe; and Turkey and the Russian Federation represent Eastern Europe. Countries that were not selected were not necessarily less developed or less significant than the above-mentioned ones. However, this particular selection was designated in order to develop a picture of how a selection of European countries perform.

Co-plot displays

Figure 4.1 Co-plot of European countries actual number of variables

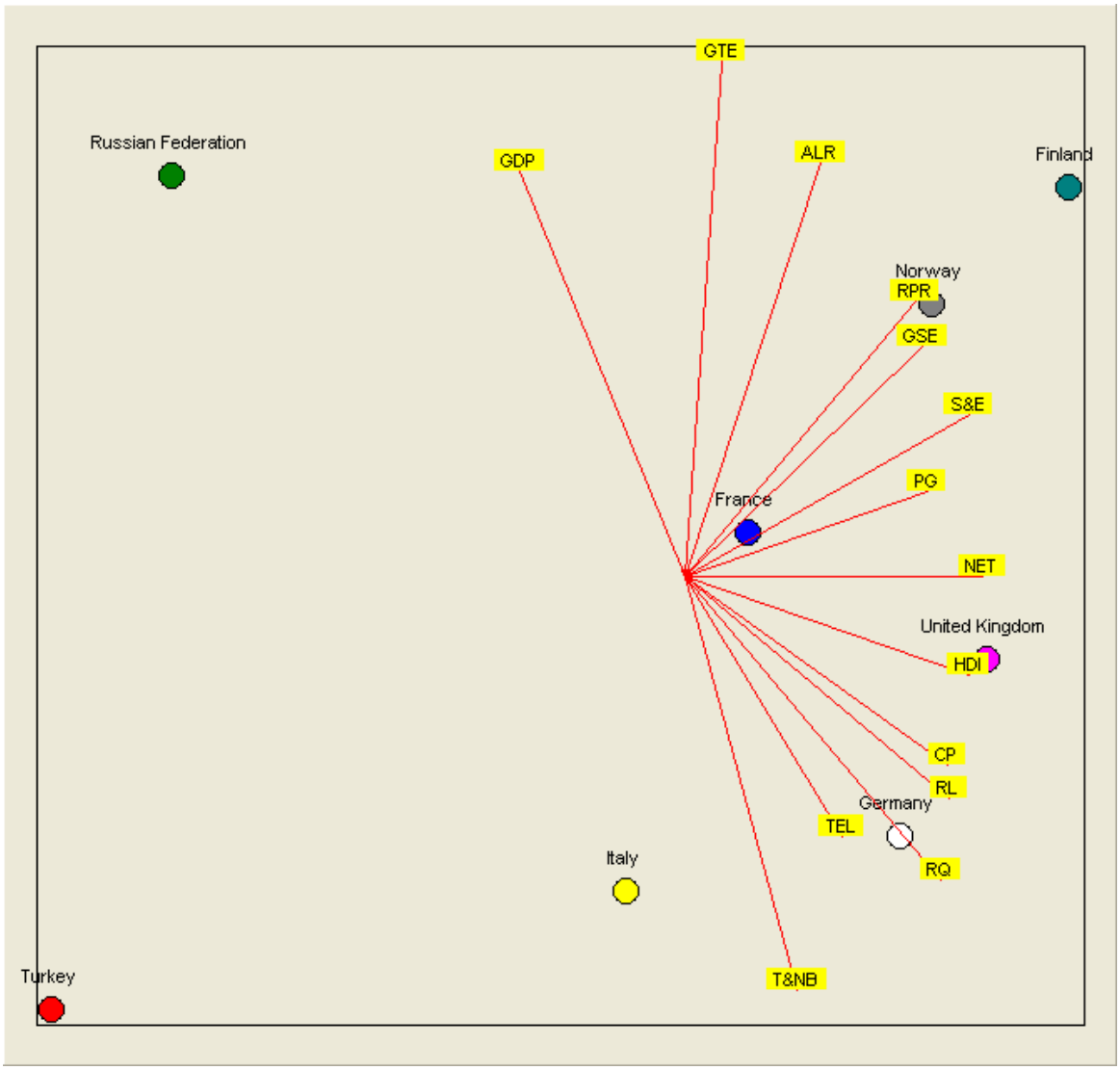


Table 4.1

Map of Observations of European Countries, Using Actual Numbers

Countries	X	Y
France	68.42	23.60
Germany	83.47	8.59
Finland	100.00	40.74
Norway	86.59	34.94
Russian Federation	11.81	41.27
United Kingdom (UK)	91.99	17.31
Turkey	0.00	0.00
Italy	56.44	5.87

Coefficient of Alienation: 0.002

Center of Gravity: (62.30, 21.50)

Table 4.2

Map of Variables of European Countries, Using Actual Numbers

Variable	Degree	Correlation
Annual GDP Growth (%)	129	0.86
Human Development Index (HDI)	-10	0.94
Tariff & Nontariff Barriers	-62	0.77
Regulatory Quality	-31	0.97
Rule of Law	-23	0.94
Royalty Payments and Receipts (US$/pop.)	31	0.88
S&E journal articles per million People	16	0.96
Patents granted by USPTO per million People	10	0.80
Adult Literacy Rate (% age 15 and above)	57	0.81
Gross Secondary Enrollment rate	26	0.86
Gross Tertiary Enrollment rate	82	0.86
Total telephones per 1000 people	-40	0.67
Computers per 1000 people	-20	0.92
Internet users per 1000 people	0	0.97

Average of Correlations: 0.873

The second co-plot using normalized number follows:

Figure 4.2 Co-plot of European countries, using normalized numbers.

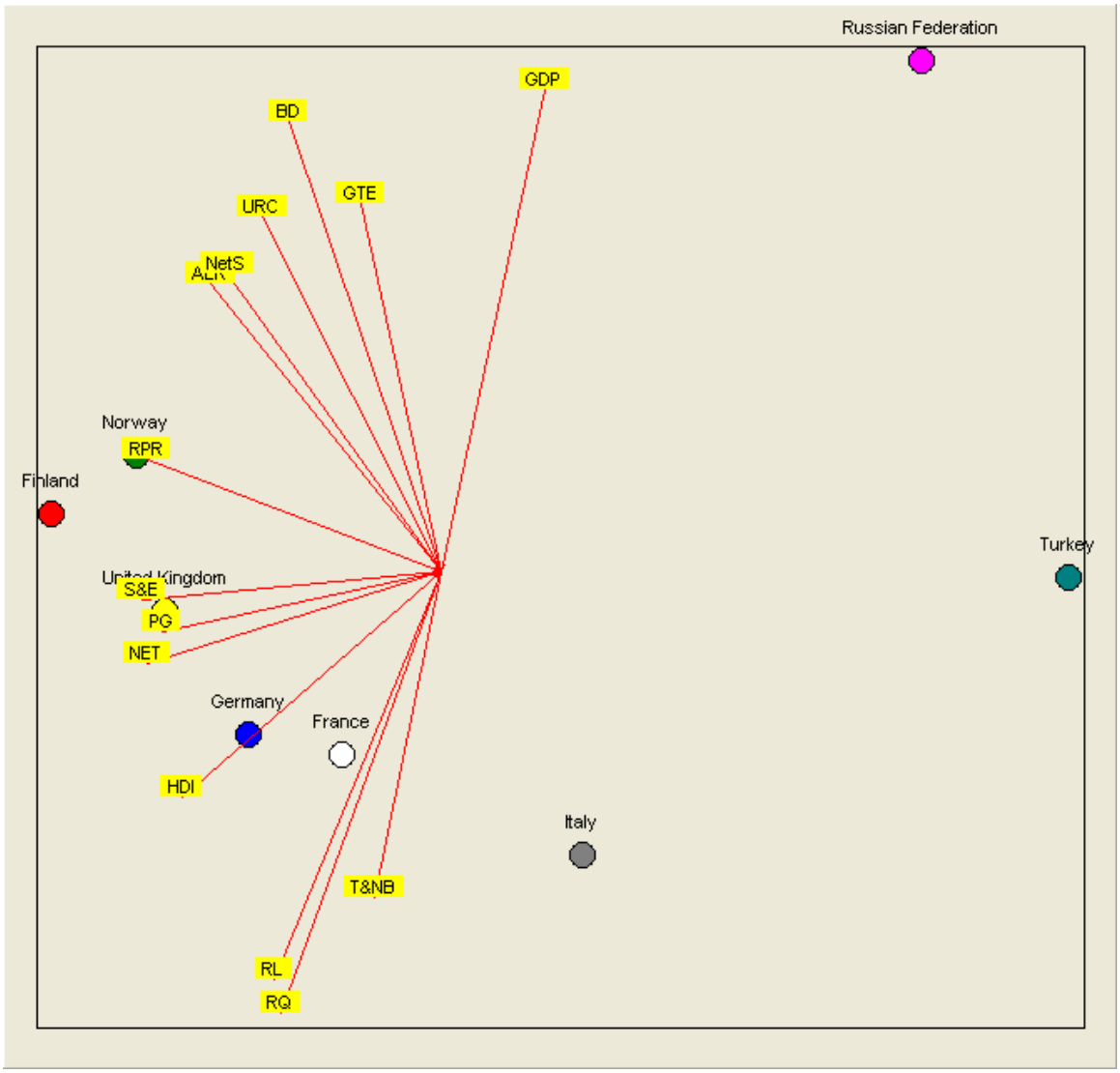


Table 4.3

Map of Observation of European Countries, Using Normalized Numbers.

Countries	X	Y
France	68.42	23.60
Germany	15.69	35.78
Finland	0.00	18.95
Norway	8.40	13.42
Russian Federation	92.66	0.00
United Kingdom (UK)	13.86	29.10
Turkey	100.00	37.50
Italy	52.30	29.60

Coefficient of Alienation: 0.014

Center of Gravity: (39.10, 23.60)

Table 4.4
Map of Variables for European Countries, Using Normalized Numbers.

Variables	Degree	Correlation
Annual GDP Growth (%)	-50	0.85
Human Development Index (HDI)	-165	0.93
Tariff & Nontariff Barriers	106	0.81
Regulatory Quality	125	0.99
Rule of Law	127	0.96
Patents granted by USPTO per million people	-161	0.92
Adult Literacy Rate (%, age 15 and above)	-130	0.93
Gross Tertiary Enrollment rate	-101	0.88
Internet users per 1000 people	-176	0.98
University-Company Research Collaboration (1-7), 2008	-152	0.80
Internet access in schools (1-7), 2008	-160	0.85
Brain Drain (1-7), 2008	-122	0.88

Average of Correlations: 0.898

Characteristic Analysis

Countries generally have certain aspects of their development that are stronger than others, and these can be stronger than is the case in other countries. As regards European countries in the northern region, Norway and Finland have similar characteristics in the category of royalty payments and receipts. Turkey and the Russian Federation have relevant weak correlations with these selected character variables.

The normalized process and editing variables provided in the second co-plot shows that Germany has a stronger HDI in comparison with the United Kingdom. In a manner similar to the previous one with the actual numbers, Norway has strong royalty payments receipts.

The western European countries and Northern European countries were more clustered than was the case in the first co-plot. Western European countries were more evenly developed with respect to both innovation (patents granted and S&E journals) and HDI. It is interesting to note that Northern and Western European countries had some similar characteristics in comparison with the previous co-plot.

East Asian

The countries known as The Four Tigers--China, Japan, the Republic of Korea, and Malaysia--and other countries that may have strong creative economies due to the development of communication technologies—were selected to represent the Asian region. In

addition, the primary countries selected were mostly located in East and South-east Asia. Incomplete data may have resulted because the co-plot software system was unable to compare and calculate correlations. Therefore, some variables may have to be discarded. There are two co-plot graphs because data is missing for Hong Kong and Taiwan. As regards Taiwan, the HDI is also missing in the original data, but the number used was provided by the government in 2010[28].

Co-plot display

This first graph was made using the co-plot and excludes Hong Kong and royalty payments, while including Taiwan.

[28] Retrieved August 10, 2011 from: http://www.dgbas.gov.tw/lp.asp?CtNode=3482&CtUnit=1088&BaseDSD=7&mp=1

Figure 4.3 Co-plot of East Asia, using actual numbers (without Hong Kong and royalty payment)

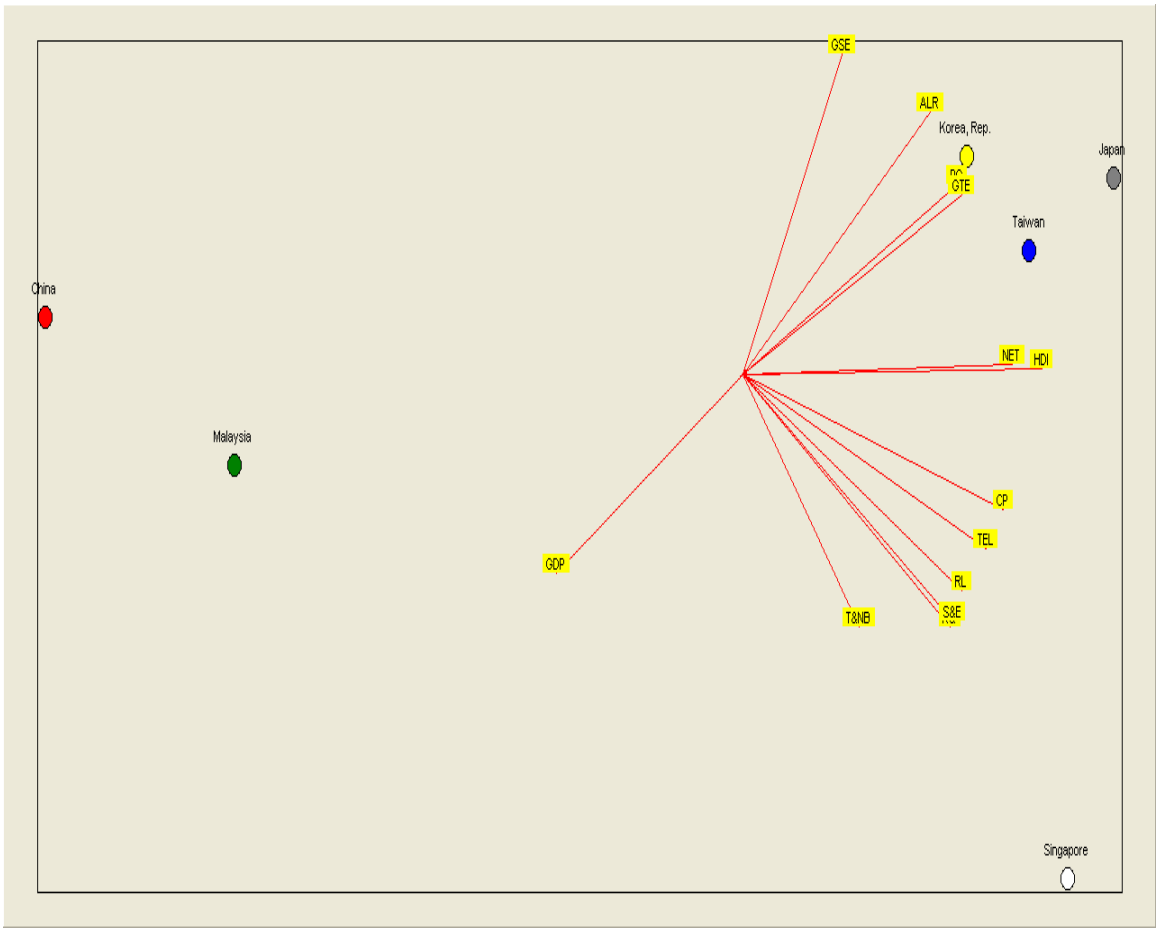


Table 4.5

Map of Observations of East Asia, Using Actual Numbers (Without HK and Royalty Payment).

Country	X	Y
Japan	100.00	2.59
Korea, Rep.	85.75	0.00
Malaysia	16.69	20.87
China	0.00	7.25
Singapore	90.00	64.46
Taiwan	91.44	9.21

Coefficient of Alienation: 0.000

Center of Gravity: (64.00,17.40)

Table 4.6

Map of Variables for East Asia, With Actual Numbers (Without HK and Royalty Payment).

	Degree	Correlation
Annual GDP Growth (%)	139	0.83
Human Development Index (HDI)	0	0.98
Tariff & Nontariff Barriers	68	0.83
Regulatory Quality	54	0.98
Rule of Law	47	0.93
S&E journal articles per million people	52	0.98
Patents granted by USPTO per million people	-35	0.87
Adult Literacy Rate (%, age 15 and above)	-48	0.97
Gross Secondary Enrollment rate	-67	0.99
Gross Tertiary Enrollment rate	-32	0.86
Total telephones per 1000 people	39	0.92
Computers per 1000 people	32	0.90
Internet users per 1000 people	2	0.84

Average of Correlations: 0.914

Figure 4.4 Co-plot of East Asia, using actual numbers (without Taiwan and SES journals).

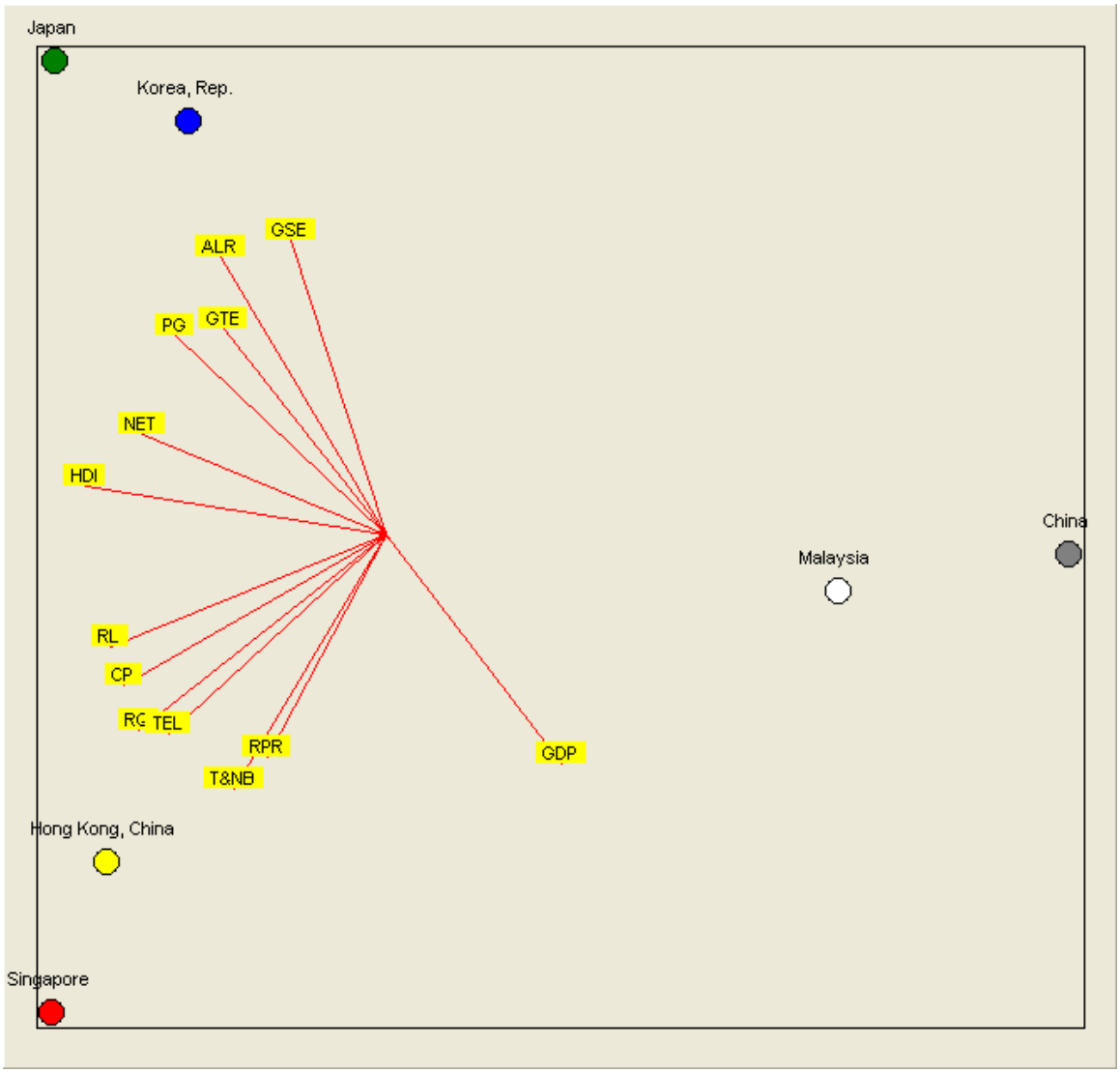


Table 4.7

Map of Observations of East Asia, Using Actual Numbers (Without Taiwan and SES Journals)

	X	Y
Japan	0.35	82.46
Korea, Republic of	13.50	77.18
Malaysia	77.30	36.58
Hong Kong, China	5.41	13.11
China	100.00	39.73
Singapore	0.00	0.00

Coefficient of Alienation: 0.000

Center of Gravity: (32.80, 41.50)

Table 4.8

Map of Variables for East Asia, Using Actual Numbers (Without Taiwan and SES Journals)

	Degree	Correlation
Annual GDP Growth (%)	-49	0.88
Human Development Index (HDI)	172	1.00
Tariff & Nontariff Barriers	-124	0.89
Regulatory Quality	-145	0.99
Rule of Law	-160	0.96
Royalty payments and receipts (US$/pop.)	-121	0.75
Patents Granted by USPTO per million people	140	0.89
Adult Literacy Rate (%, age 15 and above)	124	0.96
Gross Secondary Enrollment rate	110	0.90
Gross Tertiary Enrollment rate	132	0.79
Total telephones per 1000 people	-141	0.92
Computers per 1000 people	-153	0.96
Internet users per 1000 people	160	0.85

Average of Correlations: 0.903

The second co-plot was made due to the missing data of Taiwan's 'Royalty payments and receipts,' 'HDI' of 2008, and 'SES journals' from Hong Kong. This provides another picture

of East Asian countries' performance. The newly added variables regarding university-company cooperation may partially add to the 'innovation' dimension. The second co-plot is as fellow:

Figure 4.5 Co-plot of East Asian countries, using normalized numbers.

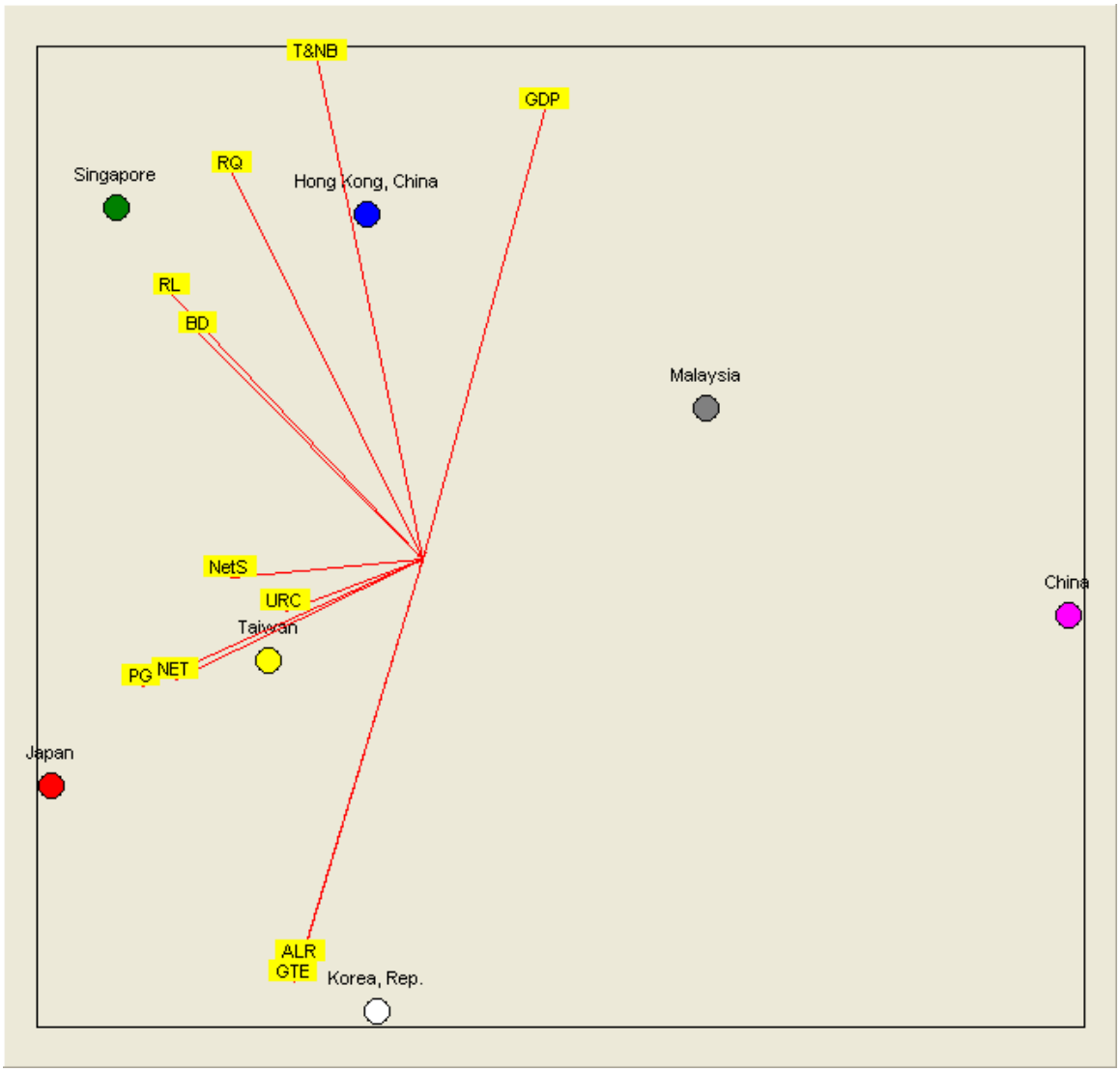


Table 4.9

Map of Observation of East Asian Countries, Using Normalized Numbers

Countries	X	Y
Japan	0.00	12.27
Republic of Korea.	32.06	0.00
Malaysia	64.42	32.70
China	100.00	21.52
Singapore	6.40	43.60
Hong Kong, China	30.99	43.25
Taiwan	21.36	19.01

Coefficient of Alienation: 0.118

Center of Gravity: (36.50, 24.60)

Table 4.10
Map of Variables for East Asian Countries, Using Normalized Numbers.

	Degree	Correlation
Annual GDP Growth (%)	64	0.90
Human Development Index (HDI)	-165	0.93
Tariff & Nontariff Barriers	111	0.96
Regulatory Quality	132	0.94
Rule of Law	150	0.95
Patents granted by USPTO per million People	-166	0.95
Adult Literacy Rate (%, age 15 and above)	-119	0.83
Gross Tertiary Enrollment rate	-119	0.88
Internet users per 1000 people	-165	0.84
University-company research collaboration (1-7), 2008	-168	0.46
Internet access in schools (1-7), 2008	-177	0.63
Brain Drain (1-7), 2008	-151	0.84

Average of Correlations: 0.835

Characteristic analysis

China and Malaysia have high GDPS (%), but in comparison with other countries some variables could stand further improvement. Japan, the Republic of Korea (South Korea) and Taiwan emphasize education, which is reflected in their high percentages for adult

literacy and Gross Secondary enrollment rates. Singapore and Hong Kong (China) have similar characteristics with respect to high 'royalty payments and receipts (US$/pop.)' and 'Tariff & Nontariff Barriers.' Singapore also has a strong characteristic in the variable 'Rule of Law.'

The second co-plots show that the Republic of Korea maintains a strong education characteristic, while Japan and Taiwan were more to the variable of "University-company cooperation." China's GDP is less strongly correlated when transforming into a normalized number when compared with actual numbers. Singapore is still characterized as 'good' in performance by the government.

North and South American countries and Oceania

The countries selected in this section are located in North America, South America and Oceania. Some countries are developed countries while others are not. This may result in divergent performances. In second co-plot, using only Canada and United States to represent North American is due to their higher economic influences over the region.

Co-plot displays

Figure 4.6 Co-plot of North and South American countries and Oceania, using actual numbers.

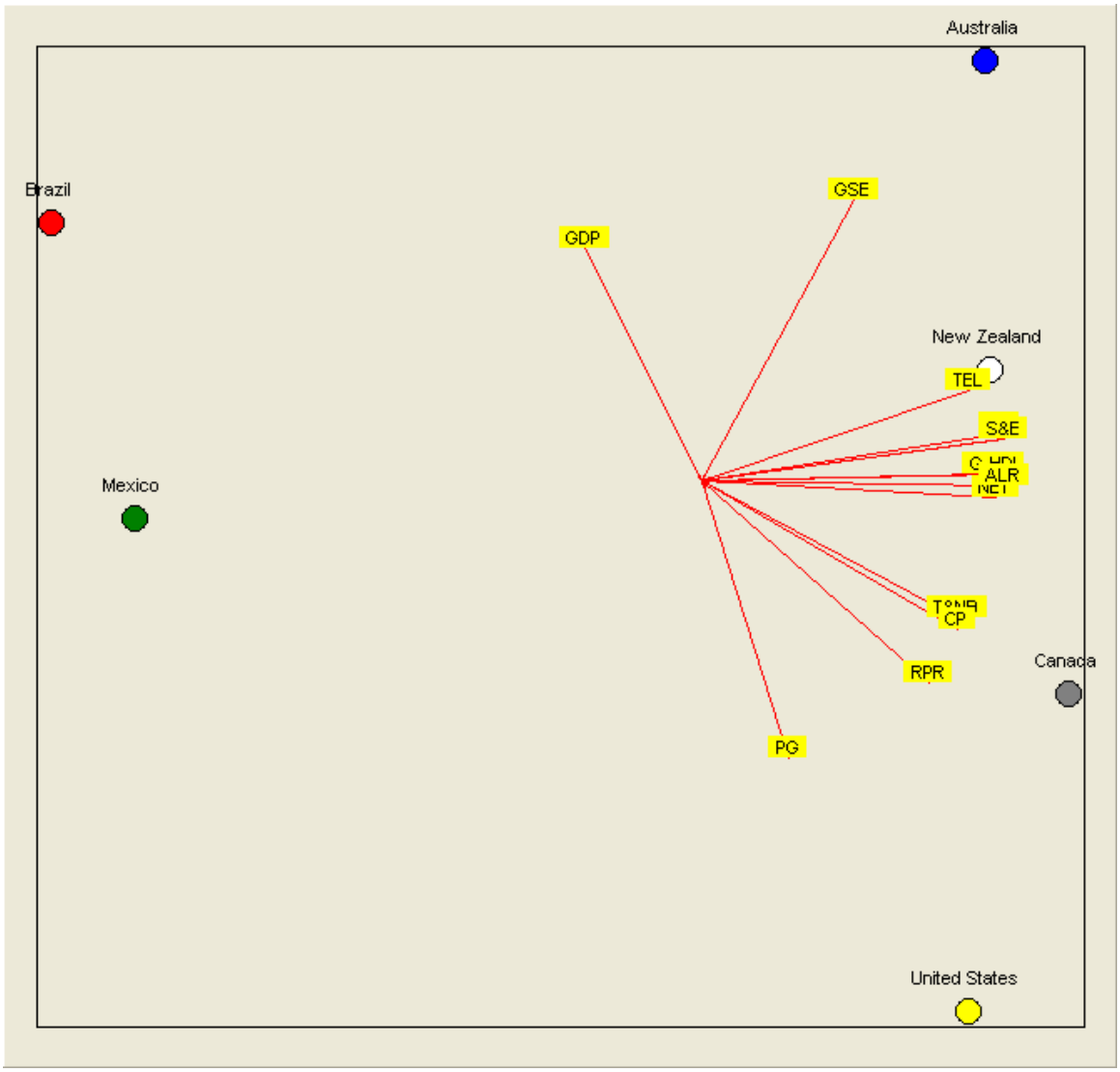


Table 4.11

Map of Observations of North and South American Countries and Oceania, Using Actual Numbers

Country	X	Y
United States	90.19	0.00
Canada	100.00	28.34
Mexico	8.24	44.17
New Zealand	92.23	57.38
Australia	91.84	85.06
Brazil	0.00	70.51

Coefficient of Alienation: 0.001

Center of Gravity: (63.80, 47.60)

Table 4.12

Map of Variables of North and South American Countries and Oceania, Using Actual Numbers

Variable	Degree	Correlation
Annual GDP Growth (%)	119	0.79
Human Development Index	1	0.99
Tariff & Nontariff Barriers	-26	0.93
Regulatory Quality	8	0.99
Rule of Law	7	1.00
Royalty payments and receipts (US$/pop.)	-39	0.96
S&E journal articles per million People	7	1.00
Patents granted by USPTO per million people	-71	0.88
Adult Literacy Rate (%, age 15 and above)	-1	0.99
Gross Secondary Enrollment rate	59	0.97
Gross Tertiary Enrollment rate	1	0.94
Total telephones per 1000 people	17	0.92
Computers per 1000 people	-28	0.95
Internet users per 1000 people	-3	0.97

Average of Correlations: 0.948

The second co-plot using normalized number display appears below:

Figure 4.7 Co-plot of North and South American countries and Oceania, using normalized numbers.

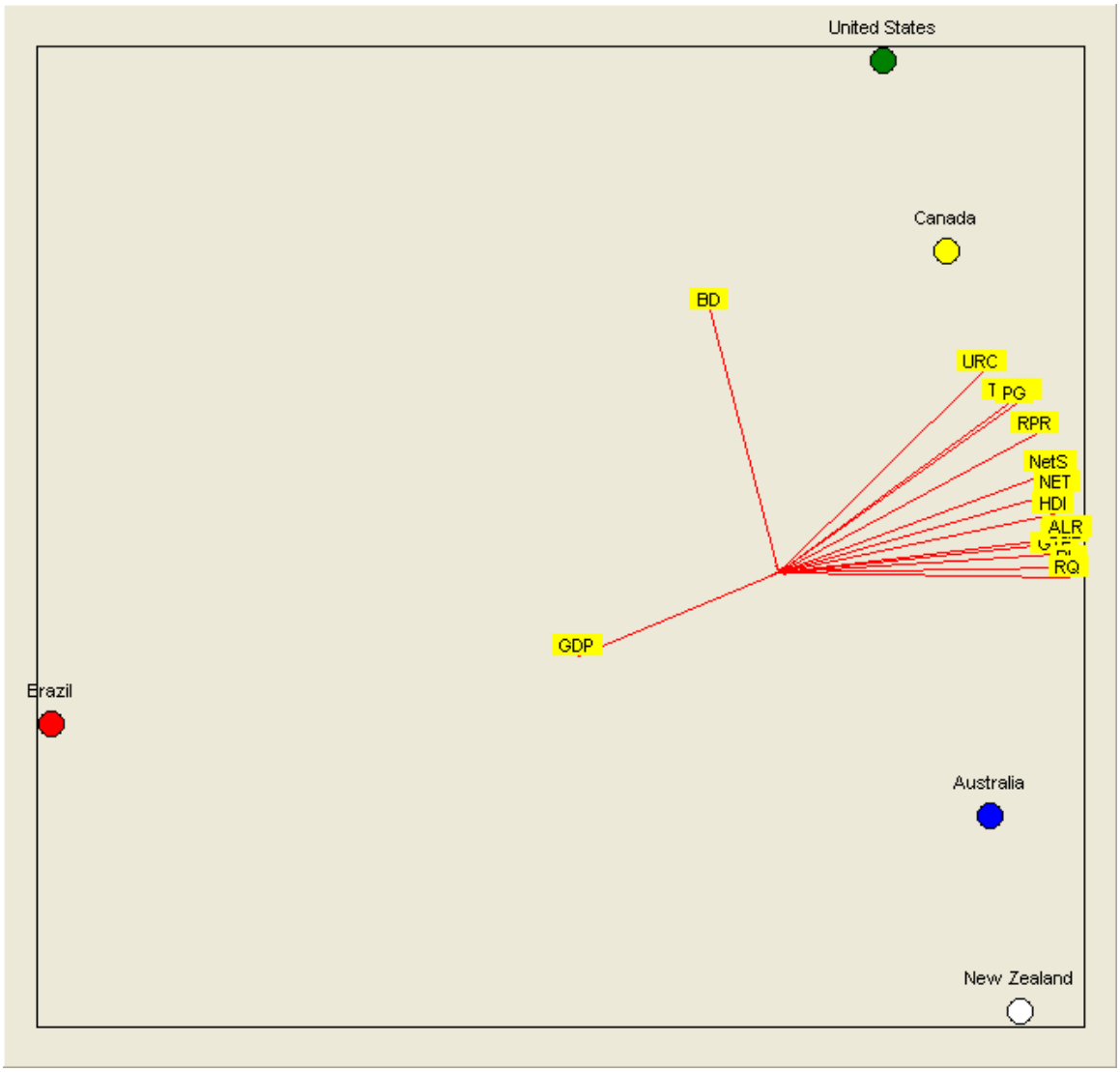


Table 4.13

Map of Observations of North and South American Countries and Oceania, Using Normalized Numbers

Countries	X	Y
United States	85.83	96.19
Canada	92.46	76.94
New Zealand	100.00	0.00
Australia	96.88	19.86
Brazil	0.00	29.03

Coefficient of Alienation: 0.002

Center of Gravity: (75.00, 44.40)

Table 4.14

Map of Variables of North and South American Countries and Oceania, Using Normalized Numbers

Variable	Degree	Correlation
Annual GDP Growth (%)	-158	0.75
Human Development Index (HDI)	12	0.97
Tariff & Nontariff Barriers	36	0.99
Regulatory Quality	-1	1.00
Rule of Law	1	1.00
Royalty payments and receipts (US$/pop.)	28	1.00
S&E journal articles per million people	6	1.00
Patents granted by USPTO per million people	35	0.99
Adult Literacy Rate (%, age 15 and above)	7	1.00
Gross Tertiary Enrollment rate	4	0.95
Internet users per 1000 people	16	1.00
University-Company Research Collaboration (1-7), 2008	44	0.97
Internet access in schools (1-7), 2008	20	1.00
Brain Drain (1-7), 2008	105	0.92

Average of Correlations: 0.967

Analysis of characteristics

There are three different categories in this co-plot. Australia and New Zealand have stronger characteristics with respect to 'Gross Secondary Enrollment rate,' while the United States and Canada are characterized more by 'Patents granted' and 'Royalty payments.' Brazil and Mexico are characterized to lesser degrees by these variables.

The second co-plot shows that the United States and Canada are similar to each other. Australia and New Zealand are also similar to each other. Most variables were closely correlated for these four countries. The United States and Canada, however, have the stronger correlations with respect to the Brain Drain characteristic. This may indicate that they both retain their own intellectual workers while hiring people from other countries as well.

Comparisons of regions and developed countries

This section uses all of the countries and regions: Africa, East Asia and the Pacific, Europe and Central Asia, Latin America, G7 (France, Germany, Italy, Japan, the United Kingdom, the United States, and Canada), the Middle East and North Africa, South Asia, and Western Europe. These countries and regions are used as independent variables to observe the characteristics of each region or group of highly developed countries. The first co-plot includes high and low income countries classified by the World Bank to show the differences between different income.

Co-plot displays

Figural 4.8 Co-plot of among regions, using actual numbers.

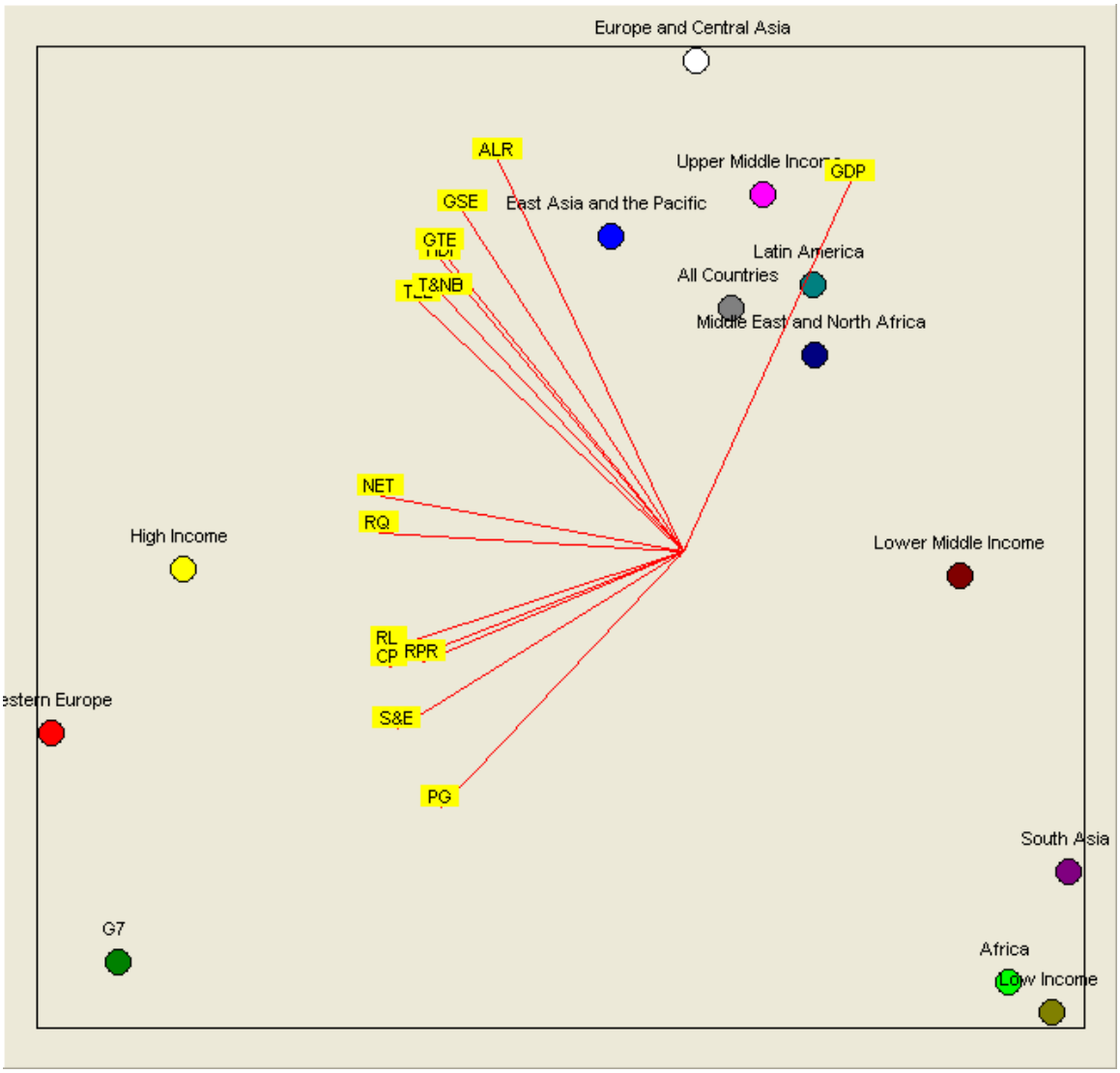


Table 4.15

Map of Observations of Regions, Using Actual Numbers.

Variables	X	Y
All countries	66.79	40.47
Africa	94.12	1.77
East Asia and the Pacific	55.06	44.66
Europe and Central Asia	63.33	54.75
Latin America	74.83	41.90
G7	6.50	2.89
Middle East and North Africa	75.12	37.79
South Asia	100.00	8.12
Western Europe	0.00	16.05
High Income	13.04	25.51
Low Income	98.41	0.00
Lower Middle Income	89.27	25.09

Coefficient of Alienation: 0.046

Center of Gravity: (62.00,26.60)

Table 4.16

Map of Variables for Regions, Using Actual Numbers

Variables	Degree	Correlation
Annual GDP Growth (%)	52	0.90
Human Development Index	145	0.97
Tariff & Nontariff Barriers	148	0.93
Regulatory Quality	178	0.99
Rule of Law	-168	0.98
Royalty payments and receipts (US$/pop.)	-166	0.88
S&E journal articles per million people	-160	0.99
Patents granted by USPTO per million people	-148	0.93
Adult Literacy Rate (%, age 15 and above)	129	0.96
Gross Secondary Enrollment rate	138	0.97
Gross Tertiary Enrollment rate	144	0.98
Total telephones per 1000 people	151	0.99
Computers per 1000 people	-167	0.99
Internet users per 1000 people	174	0.99

Average of Correlations: 0.960

The second co-plot, using normalized numbers, as follows:

Figural 4.9 Co-plot among regions, using normalized numbers

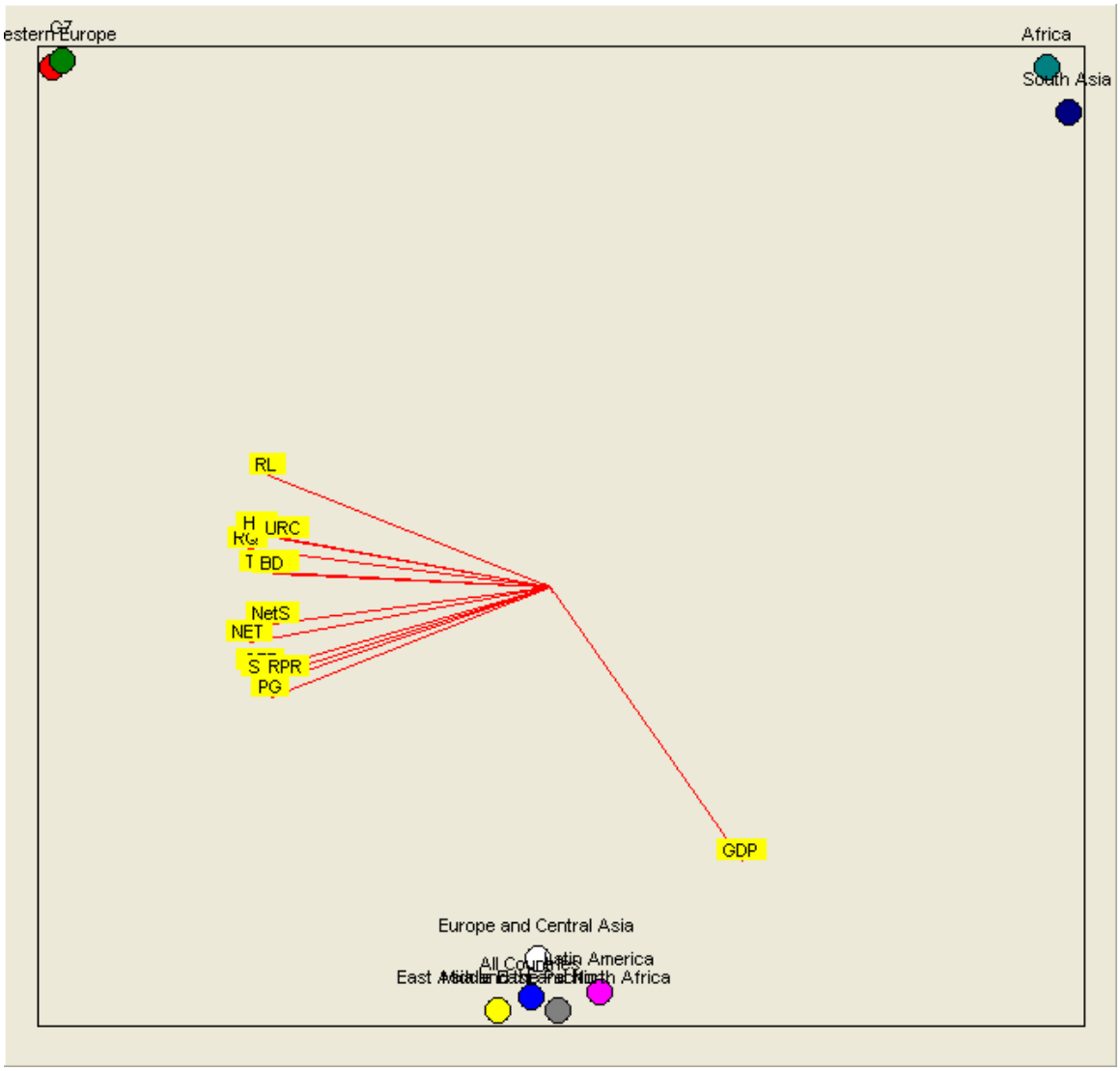


Table 4.17

Map of Observations of Regions, Using Normalized Numbers

Countries	X	Y
All countries	47.19	0.84
East Asia and the Pacific	43.87	0.00
Europe and Central Asia	47.77	3.49
G7	1.01	63.21
Middle East and North Africa	49.79	0.03
South Asia	100.00	59.82
Africa	97.85	62.78
Western Europe	0.00	62.73
Latin America	53.90	1.20

Coefficient of Alienation: 0.018

Center of Gravity: (49.00, 28.20)

Table 4.18

Map of Variables For Regions, Using Normalized Numbers.

Variable	Degree	Correlation
Annual GDP Growth (%)	-44	0.87
Human Development Index (HDI)	173	0.97
Tariff & Nontariff Barriers	178	0.92
Regulatory Quality	175	1.00
Rule of Law	165	0.96
Royalty payments and receipts (US$/pop.)	-168	0.95
S&E journal articles/million people	-168	0.95
Patents Granted by USPTO per million people	-165	0.95
Adult Literacy Rate (%, age 15 and above)	173	0.90
Gross Tertiary Enrollment rate	-169	0.97
Internet users per 1000 people	-173	1.00
University-Company Research Collaboration (1-7), 2008	173	0.88
Internet access in schools (1-7), 2008	-175	0.92
Brain Drain (1-7), 2008	178	0.91

Average of Correlations: 0.934

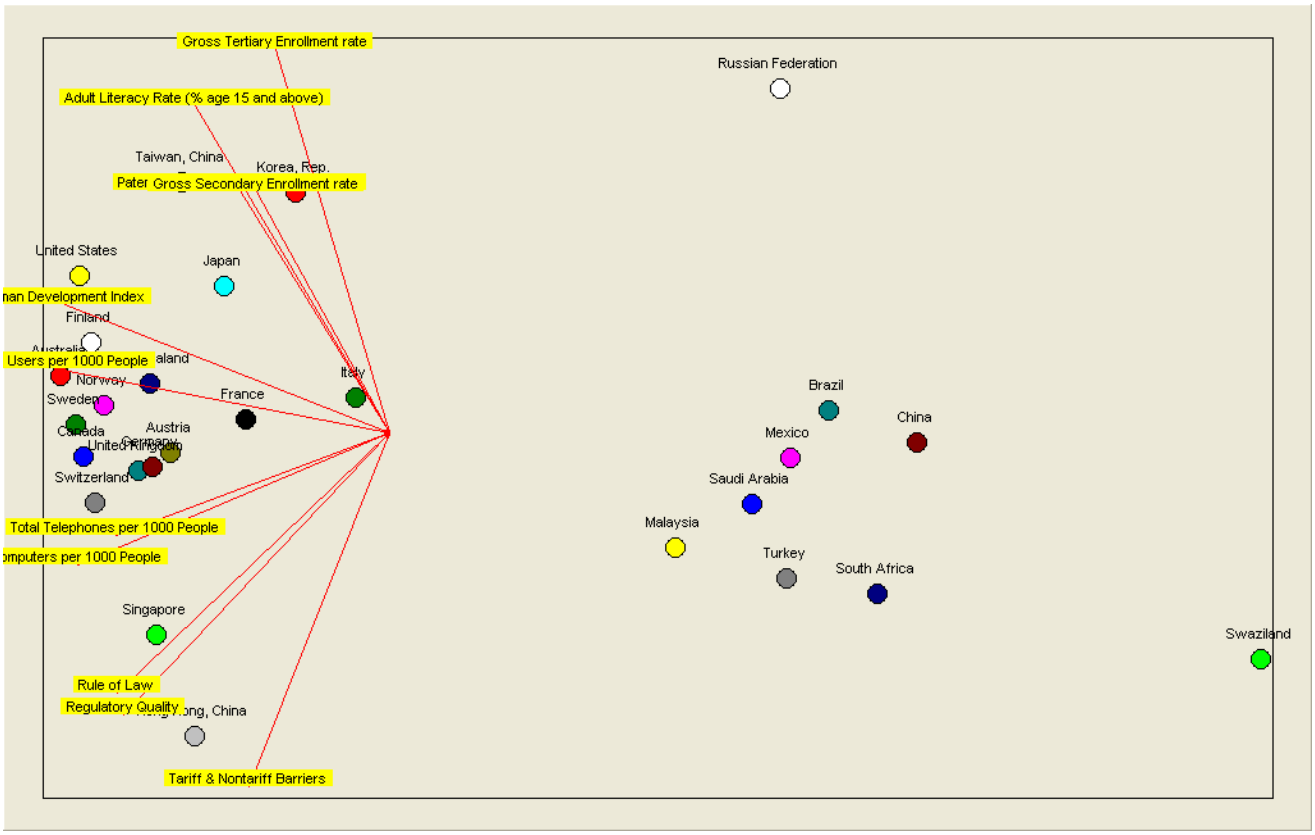
Analysis of characteristics

G7 and Western Europe are characterized by stronger S&E journal articles and royalty payments. Regions such as East Asia and the Pacific, Europe and Central Asia, the Middle East and North Africa, and Latin America are characterized by GDP. South Asia and Africa are relatively lower with respect to these variables. The second co-plot graph shows outcomes that are similar to the first co-plot graph. G7 and Western European countries still have a stronger correlation to many variables when compared to other regions.

Overall picture

This overall picture includes most of the countries and data from the KAM for the purpose of observing overall performance among countries.

Figure 4.10 Co-plot of all countries available, using actual numbers.



Analysis of characteristics

In general, most of the countries in or near Europe, North America, and Australia have similar characteristics with respect to high HDI and use of communication technologies. The Asian countries, meaning Taiwan, South Korean, and Japan, are characterized by high literacy rates and high educational enrollments. Singapore and Hong Kong are characterized by “Rule of Law” and “Regulatory Quality”.

Reflections and critiques

This section is based on the literature reviews and co-plot displays. The first part of

this section discusses future usage of the co-plot method and its implications. This method can be used to provide a visual picture that can facilitate our understanding of how one country performs in comparison with other countries or regions. Such a comparison has implications for the future when weak and strong variables are considered in conjunction with each other.

The second part of this section analyzes how higher education contributes to creative economies and open education, that is, the concept of open knowledge production. Higher education can play a major role in offering open knowledge to large numbers of people. Although creative economies and open education have attracted the attention of policy-makers, policies concerning higher education should be evaluated critically in light of the interactions shown on the co-plot graphs and data.

The implications of the meaning of the co-plots

The results in the co-plot graphs provide an overall picture and a basis for comparison among various countries and regions. Policy-makers can use them when considering which characteristics they prefer to emphasize or change after making comparisons with other countries. From pervious literature review showed policy involves complex power relationship and interaction among agencies locally or globally. Policy makers should consider all different aspects and influences while conducting policies.

In addition, the literature review has shown that creative economies and open

education involve complex concepts and have applications within multiple levels, such as open classroom, open school, and open course resource as well as knowledge economy and policy supports. One strong variable in and of itself may not necessarily lead to the full development of creative economies or open education. For instance, comparisons of different regions show that there is an unclear relationship among high GDP, creative economies, and open educational development. Countries with highly a developed knowledge economy and technology often exhibit better creative economic performance and a greater degree of open education. Among developed countries, there are still different characteristics showing the diverse features of open education and creative economy development. The variables related to the creative economy and open education are most often found in developed countries, and in some high-performance developing countries that are primarily located in the northern hemisphere.

This co-plot method gives an overall picture of how different countries and regions perform. Stakeholders, policy-makers, or researchers can observe the variables and compare for different countries and regions. This can also help the general public easier to understand strong or weak economic performance and give them reasons to support the development of their own countries.

Open Knowledge Production and Critiques

Higher education can contribute to creative economies and open education by

promoting open knowledge. This section includes discussion of open knowledge and how higher 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 (Colin G. 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 (2010c.) 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, 2010c, 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 (2010c., 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[29] (also in Peters, 2010c, p .253) claimed that the core competencies of Web 2.0 include:

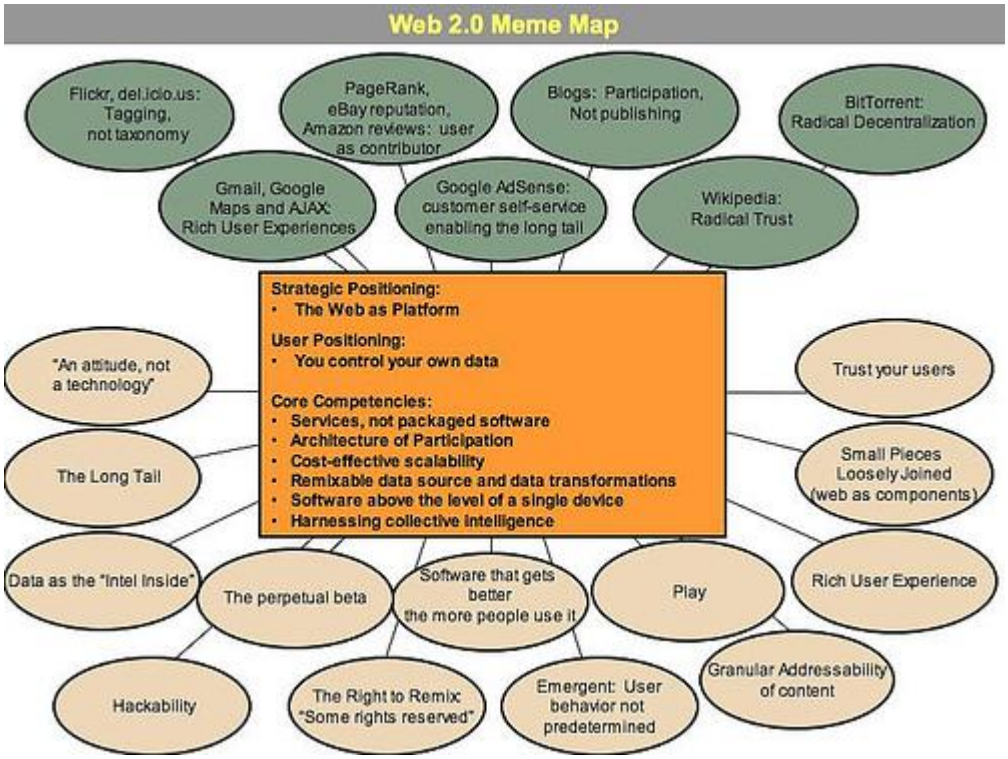
1. Services, not packaged software, with cost-effective scalability
2. Control over unique, hard-to-recreate data sources that become richer as more people use them
3. Trusting users as co-developers
4. Harnessing collective intelligence
5. Leveraging the 'Long Tail' through customer self-service
6.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

---

[29] 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,

7. Lightweight user interfaces, development models, AND business models

Figure 4.11 Web 2.0



This shows a "meme map" of Web 2.0, developed during a brainstorming session at FOO Camp, a conference held by O'Reilly Media[30].

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,

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

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, 2009c.). 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 (Compayré, 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[31] 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

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

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 property[32]. The following quote comes from his article summary about "The Economic Logic of 'Open Science"':

> '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

[32] The conference Science in the 21st Century. Retrieved Jan., 10, 2011, from: http://www.science21stcentury.org/abstracts.html

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
6. 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).

P2P becomes the important feature of open knowledge production when it is put into practice and applied to open education. The network relationships of P2P provide individuals and peer networks with means of developing interactive knowledge production relationships. P2P is a means of collective knowledge production in which inclusive individuals can choose to contribute and cooperate to achieve efficient knowledge production. Open education adapts P2P systems to increase peer learning and knowledge production, and provides learning opportunities and knowledge production for individuals and society.

Serve the public good and act as a form of social businesses

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 method 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.

Short summary of open knowledge

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.

Human resources related to creative economy and open education

Creative economies require creative human resources as well as environments that encourage creativity. The concern of Human resources has emerged as part of global policies that tie into issues of knowledge economy.

Human capital theory has traditionally required training and education costs as investments that serve to increase individual income and vocation differentials (Becker, 1964). Human resources notions date to medieval England, where craftsmen organized themselves into guilds to improve their skills. Guilds were the forerunners of labor unions (Invancevich, 2001). The Industrial Revolution changed working conditions while social changes at that time influenced worker-owner relationships. By the 19th century, scientific management and welfare concerns dominated the field of human resources, and later still, industrial psychology was added to the field during the two 20th-century world wars (Dulebohn, Ferris, & Stodd, 1995; Invancevich, 2001). Taylor (1947) developed ideas about scientific management through measurements of worker performance that analyzed production efficiency by using time-and-motion studies. His approach selectively emphasized scientific measurement, harmony cooperation, and maximizing output. Contemporary industrial psychology focuses on individual differences and working conditions (Invancevich, 2001). Mayo (1945) argued that social interactions and workplace peers influence individual work

satisfaction and output. Public and non-profit organizations face challenges that include the economy, the legal environment, social issues, and culture. Human resource managers may need to adopt strategies that take into account these new challenges (Pynes, 2009).

Human capital theory currently seeks to consider the abilities of individuals, corporations, and nations in order to compete on a global scale (Rizvi & Lingard, 2010). Human resources perspectives have become an important issue in discussions of the global knowledge economy. Policies that refer to the knowledge economy involve knowledge-intensive human resources and have led to increased enrollment in educational institutions. Human resource and knowledge inputs that involve technological innovations can improve knowledge products (Romer, 1994). The nature of the cause-effect relationships among human resources, knowledge economy, and national economic growth remain problematic and are the focus of ongoing research (Kenway, Bullen, & Robb, 2007). Human resources problems are therefore a policy issue in the area of global knowledge economic development. Creative economies and open education can help increase the quality of human resources. Emphasizing human resources and knowledge economies promotes creative economies and open education.

Creative economy encourages creativity and collective innovation. This encourages human creativity and can help improve intellectual cooperation. Open education can provide education to greater numbers of individuals, which can help improve the quality of human

resources. The value placed on human resources and knowledge economies encourages creative economies and open education to contribute to intellectual production. Organizations and societies that encourage openness can promote individual creativity and learning, and help improve the quality of human capital.

Critical Perspectives on the Creative Economy, Open Education, and Open Knowledge

The ideal concepts of these issues may be quite positive for education, but these issues still retain some negative side effects, especially in actual practice. As to open education and knowledge, there are also some critical issues, such as limitation of web access, education quality, copyright challenges, offer knowledge into wrong hands (terrorists, for example), learning efficiency, teacher training, English world dominating, and so on (Bonk, 2009). These issues and other critical perspectives are important for developing sound education system.

It is difficult to attain consensus in defining the concepts of creative economy, open education, and open knowledge. The attribute openness underlying the three concepts allows the freedom to expand the boundaries of these concepts. In adopting the openness concept, different countries or societies may try out different applications.. Economic development is the central issue, and different means are introduced in varying contexts. Achieving development of creative economies, open education, open knowledge, and open concepts are the core goals of an open society. Diverse applications can be implemented in

different contexts.

The absence of human subjectivity in related discourses

Human subjects are absent in many discourses, possibly because there is the silent assumption that human subjectivity has already been included or has simply been set aside in order to focus on economic factors. Descriptions of policies tend to focus on macroeconomic issues such as economic development or international competition. For example, a U.N. report (UNCATD, 2008; 2010) emphasized the economic benefits available from transforming cultural industries, but did not exhibit any specific concern for individuals.

The creative economy involves economic concerns, an openness within society, and acceptance of individual human subjectivity. The welfare of individual human subjects is at the heart of the development of societies and economies. The openness system requires members to have a tolerant perspective and respect other people. Human subjects contribute to knowledge creation and interactive cooperation and supply collective knowledge production. Creative economy and open education are based on the activities of the individual or collective human subjects. The operations of the socioeconomic system and human subjects are related to interactive influences. Emphasizing system structures over individual human subjects and their welfare can lead to unbalanced development and reduce the potential development of individual abilities.

Open knowledge serves as a primary contributor to creative economies and open

education, and raises awareness of the importance of the welfare of individual human subjects. Open knowledge systems encourage individuals to participate in cooperative enterprises and to share P2P knowledge production. P2P relationships should respect individual subjectivity in order to encourage sharing and contributions. Policies intended to develop creative economies or open education must recognize the importance of the welfare of individual human subjects. Long-term development policies should balance the welfare of individual human subjects with the development of social structures.

Threats and opportunities for higher education

Many policy-makers regard higher education as an economic development tool. This damages higher education's traditional role of serving the public good, while restricting its potential for contributing to private interests and public good. Higher education is often concerned with human resources development and economic development, as happens with the OECD or the World Bank. This perspective is partially correct, but may lead to either of two problems. One problem is the importance of higher education's tradition of knowledge production for public good. Another problem is treating higher education's role as being a passive, top-down model role that restricts higher education's potential for active, positive contributions to social and individual development.

Higher education has the potential to play a positive role in offering open knowledge that can contribute to the development of creative economies and open education. The

argument for the importance of universities in innovative systems often emphasizes the economic aspects, but also shifts the focus away from cultural and social contributions (Cowan, 2007).

> Here is the public good, which does serve to help innovation system, though in a very general way: The university produces basic, public knowledge, and a stream of graduates who understand it (Cowan, 2007, p.146).

Neither industries nor external innovation systems are universities' clients, so universities treat knowledge as a means of understanding the truth instead of focusing on the market value of knowledge (Cowan, 2007). Higher education must pay attention to its traditional research role and serve the public good. Research that lacks immediate market value can turn out to be important to the academic world and to the larger society. Higher education should encourage the pursuit of truth and thereby promote the long-term development of civilization.

Liberal education encourages the development of insight by combining culture and creativity. The purpose of a liberal education is to shape individuals to become mature and rational human beings. O'Hear and Sidwell (2009) stated that educating children to become rational and free through liberal education depends on the 'three Cs' (curriculum, canon, and character). They define them as follows: curriculum involves the knowledge and skills that help students learn; canon refers to 'culture treasures,' and views civilization as a series of

‘ongoing conversations;’ character emphasizes the moral and rational freedom of self-autonomy (O’Hear, & Sidwell, 2009, p. 7). Higher education provides knowledge that individuals absorb (the ‘culture treasure’) as they also develop the ability to extend an ‘ongoing conversation’ to wherever it may lead by producing new knowledge. Higher education may use the academic networking and open knowledge culture to educate individuals and conduct collective knowledge production (Peters, 2010d.). Individuals shape their characters as future citizens through higher learning by participating in collective knowledge production and P2P relationships.

Although higher education may serve the public good, in practice it may also provide for the practical needs of society and private interests. The OECD’s *The Well-Being of Nations* (2001) defined social capital as “networks together with shared norms, values and understandings that facilitate cooperation within or among groups” (p. 41). The accumulation, access, and validation of knowledge all rely on networks of social capital that involve levels of trust, relationships between knowledge producers and users, and delivery of services (communication and education) (Schuller, 2007). Interactive learning may transform local learning to general knowledge (Lundvall, 2007). Higher education can play a crucial role in fundamental research, as well as offering networks for knowledge production.

In reality, the unequal resources, varying degrees of openness, and less effective interactive relationships may also restrict the development of creative economy, open

education, or open knowledge. Countries or higher educational institutions with more mature development may have an advantage in better developing in these three aspects. This may result in such countries dominating economic growth and the power of defending or interpreting knowledge. This also causes increasing gaps among different countries and institutions. Overall educational opportunities and equity issues are complex, involving not only education systems, but also social, political and ideological systems. Educational poverty among the poor may result from the 'no-poor' social level defining interests and influences policies and actions (Reimers, 2000). To overcome local and global problems educational inequalty, an open society needs critical approaches for the reform of social systems and policies, and better use of educational resources.

Higher education faces many challenges, but also has numerous opportunities in a society that emphasizes market values. The creative economy and open education bestow upon higher education the opportunity to transform its role for the purpose of balancing traditional ideals of serving the public good and promoting private interests in the marketplace. Open knowledge enables higher education to be able to share and produce collective knowledge, which serves the public good on one hand, and on the other, allows for some market value knowledge production to be conducted within open knowledge processes and their networks.

Chapter 5

Conclusion and Recommendations

Conclusion

Open education and its relationship to open knowledge and the creative economy

The main element of open education is offering education resources to inclusive individuals and promoting open knowledge. The openness concept and applications of open education can be viewed as a kind of open system of education that opens boundaries and access among learning disciplines. Moreover, the relationship among open education, creative economy and open society is that open education provides open knowledge, referring to rising human capital and a culture of openness that promotes fundamental development of creative economy and open society. On the other hand, creative economy and open society also encourage open education development. This is due to a combination of a developing creative economy and the needs of open society. This combination encourages improvement in communication technology and the culture of networking, which can also be useful of furthering open education, such as with Web 2.0 and P2P relationships.

The role and significance of open education

Open education originally offers education opportunities and resource to more inclusive people. It provides the platform for participants to interact and construct collective knowledge production. Therefore, one important role of open education in a creative

economy and an open society is the role of constructing open knowledge. The model of creative economy, open education and open society is based on mature open knowledge in the context of domestic social economy. Open knowledge is one of the main common features for creative economy and open education. Additionally, open knowledge provides feedback for encouraging the development of creative economy and open society. Domestic economy, infrastructures and their characteristic features also serve as the foundation for creative economy and open knowledge development.

Open knowledge production, which directly contributes to the needs of a creative economy, offering valuable knowledge. The culture of openness in knowledge and interaction through networks, as well as P2P relationships, encourages developing an open society. Open education with its characteristic open knowledge can be viewed as an important feature for present education.

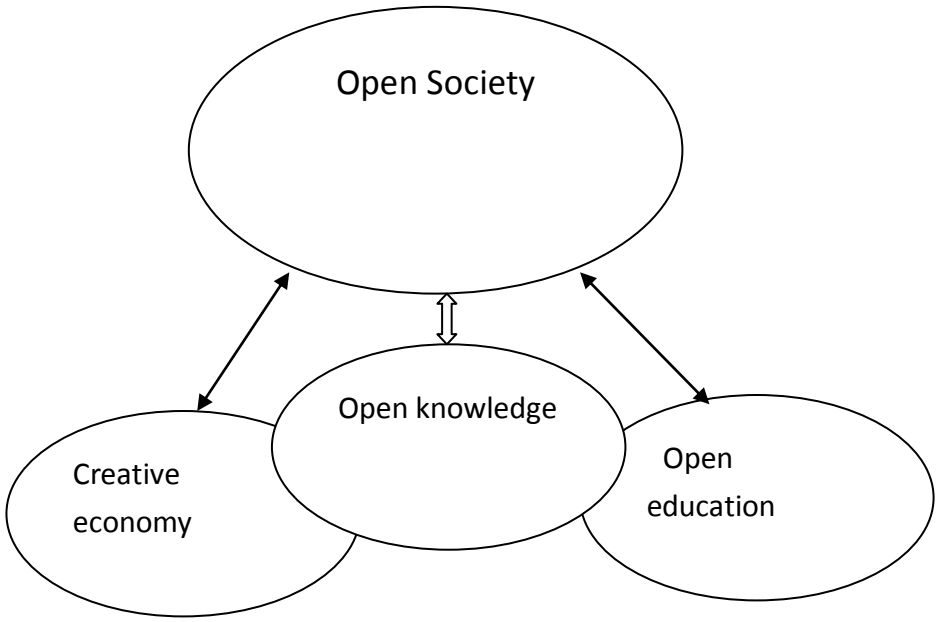
The role of higher education in the creative economy and open society

Creative economy relies on many aspects of development, such as policy, education, social culture, business corporations, and technological infrastructure. Although creative economy needs many crucial facets to conduct its development effectively, higher education may also play an important role. First, higher education provides a high-quality human resource for the socioeconomic development. Second, higher education can be the hub for the creative economy network, offering research and a platform for knowledge production. Third,

the context of open knowledge and its culture provide collective knowledge production and the culture of openness in society.

From a broad perspective, open society can be based on creative economy, open education and open knowledge. Through the interaction among creative economy, open education, and their common concept of open knowledge, enhances the development of open society. Creative economy and open education alone may also contribute to open society as offering either openness of economy and education. However, the main contribution is the combination of both into open knowledge, which may strongly support open society as open culture and knowledge production, and feature intellectual citizens with open ideas. This figure is illustrated below.

Figure 5.1 Supporting open society



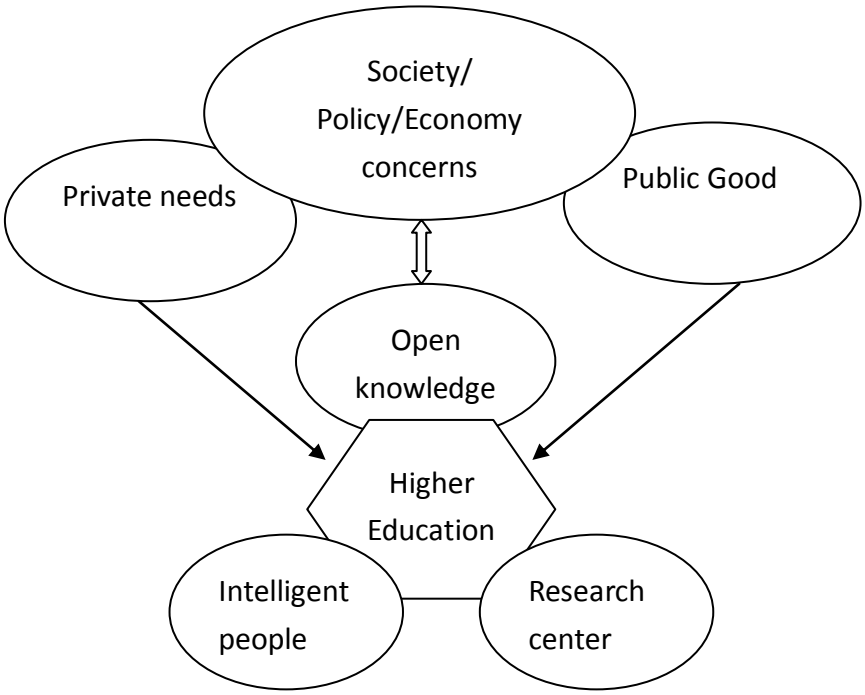
The overall interactive relationship among higher education and its surroundings shows complex challenges, but also, opportunities for higher education. The pressure or expectations for higher education rise come from the public as two main streams: for the public good and to fulfill economic needs for either public or private sections. In responding to these demands, higher education currently faces many challenges, especially the cutting of funding and market forces. However, with the collective intelligence and research foundations, higher education may contribute by transforming itself into the role of provider of open knowledge. In such a case, higher education may use its original strength to further develop as an intelligence hub for society and to offer knowledge creation for conducting a creative economy. Although higher education's research is not always directly related to immediate applications and business profits, its research may still serve as an important foundation for future applications, or for the broader general field of knowledge--or, as a driver of culture for societies searching for truths. Higher education has the characteristics of having a tradition of doing public good, attracting public attention, and developing high-quality intellectual networks. All these characteristics allow higher education to play the role of provider of open knowledge within society.

Higher education is not merely reflecting what a society expects, but through open knowledge it interacts with and influences the public. Higher education may conduct creative economic activities such as working with local companies and engaging with creative people.

This may regenerate economic activity and gain profits for higher education to help overcome funding cuts.

Moreover, higher education offers intellectual development and an infrastructure through which to share, create, or produce collective information and open knowledge. Open knowledge offers educational resource in the form of raising human intellect and providing social awareness about important issues. These may influence public policy concerns. Figure 5.2 shows the interactive relationships of higher education with other elements and illustrates open knowledge as an important bridge among these factors.

Figure 5.2 Interactive relationships among higher education, open knowledge and society.



The results of comparison structure (co-plot) and alternative models

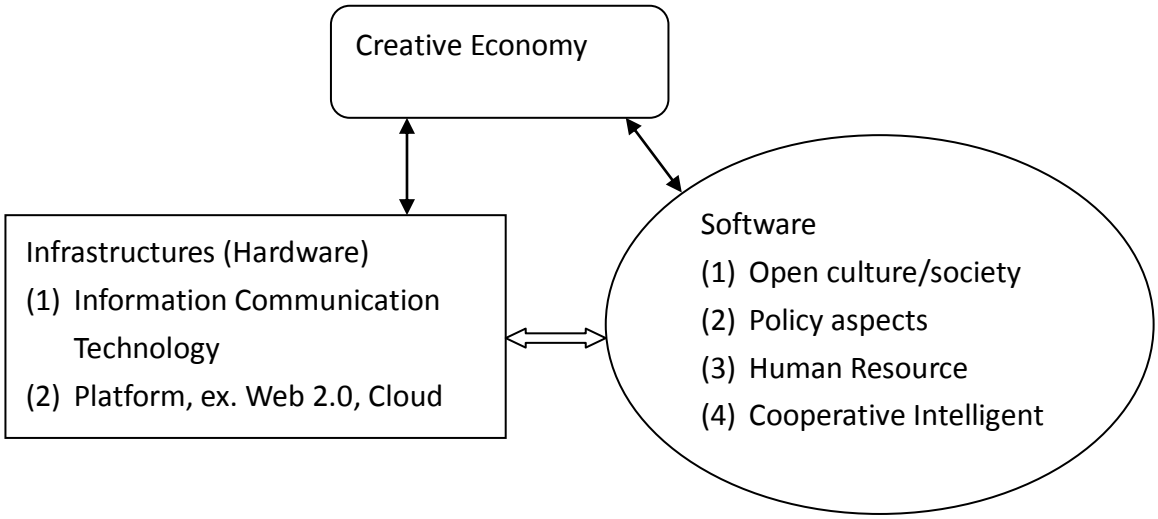
Comparison structure (Co-plot) provides the overall perspective of some performances

among countries. Each country has its cultural and social content for different forms of creative economy and knowledge economy as they react to economic needs. Countries with high GDP may not necessarily display strong creative economies and open education development. However, countries with stronger development of creative economy and open education may lead to fuller development of an open society. In addition, the co-plot also provides a visual picture with which one may view different characteristics and development of a specific country. This can give an overview of a global comparison and offer data for future research.

As to the development of creative economy, two categories may contribute to creative economy. The first one is the hardware part, also mostly referring to infrastructures and including (but is not limited to) ICT and other technological developments that support openness, creativity, and innovation. The second is the software aspect consisting of many other important elements. In this part, what first appears are open culture and open society. Creative economy relies highly on the "openness" concepts, which encourage conducting creative, cooperative, and innovative activities. What follows the first one are the policy aspects, which include government supports and relevant policies. Intelligent people and how they cooperate are also important, which also relates to educational issues. From the co-plot outcomes, high GDP may not necessarily lead to full development of other types of intellectual performance, especially when comparing developed countries and developing

countries. To achieve full development of creative economy, there need to be more than one aspect of development among infrastructure and software. The co-plot analysis shows that countries with high GDP do not necessarily have high creative economic performance. As mentioned above countries with fuller development in many aspects, such as those in Western Europe, East Asia, or the U.S., are recognized as having better development in creative economy, but they are not featured with highest GDP. Figure 5.3 shows the structure of elements supporting and influencing the creative economy.

Figure 5.3 Influences on the creative economy



Recommendations

For policy making and higher education development

Policy-makers may want to consider the unique role that higher education is playing in open knowledge. Higher education is in a positive position of constructing open knowledge,

with respect to which it plays a crucial role. Higher education is characterized by its research and its educational offerings and services, which can all merge to produce open knowledge. Policy–makers may take higher education into consideration as the role of open knowledge contributes to socioeconomic development.

More applications for and promotion of open knowledge can be constructed and studied. Open knowledge provides the knowledge for more individuals and supports collective knowledge production. The applications of open knowledge and its contents can be further explored. Developing open knowledge may contribute to higher education's competition and the creative economic development.

Creative economy and open education offer developing countries and societies opportunities to transform their local cultures, modes of living, and physical and social environments through economic growth and the education of greater numbers of people. Creative economy and open education can help support infrastructures, policies and innovations. Creative activities can help promote the development of creative economies and open education. Creative economy sometimes also creates negative influences or misuses openness, in ways related to negative aspects of capitalism. Comparison analysis shows that many developed Western countries have advantages as a byproduct of their overall economic development. Concepts of openness and creativity may predominate and serve as extensions of Western capitalism. The definition of success in economic competition is often framed in

terms of concepts of global neoliberalism. Global neoliberalism is often an extension of Western forms of the misuse of capitalism, because developed countries are often better positioned to take advantage of opportunities for economic growth than are developing countries. This raises the concern that the rich will get richer while the poor become poorer. These divisions appear among countries and within a society or a local community. Policy-makers should pay attention to and consider the above-mentioned negative influences and the effects of the misuse of openness and capitalism.

Different groups of creative workers might overly compete with one another instead of cooperating for resources, which is apt to affect the sound development of creative economy. Besides, educational opportunities could remain unequal even under open education, if open education is limited by the development of infrastructures and restrictions on the amounts of insufficient resources. Not everyone has access to internet and education resources globally, which restricted the growth and use of open education. Policy-makers need to be aware of such negative factors and seek better solutions while promoting creative economy and open education.

For example, policy-makers in Taiwan can strengthen their efforts concerning the “rule of law” so as to facilitate the development of the knowledge economy, which is the foundation of creative economy and open education. The next step is to promote new policies regarding the “rule of law” and to conduct further studies regarding the steps needed for

future development. Although the relatively high adult literacy rates and educational enrollment rates occur in Taiwan's development, the quality of these aspects should not be neglected. These performance variables should be further studied in order to better understand the actual quality rather than the numerical index of performances. How to maintain or improve what is stated as good performance in some variables is also important.

In the long run the over emphasis on markets and economics may restrict the development of creativity, innovation, and education. Some original ideas may not necessarily lead directly to immediate marketplace profits. Culture and knowledge products are not always intended to produce profits economies, but rather to promote the long-term development of civilization. Higher education plays a role by supporting various types of research, and such research could either be valuable in the marketplace or could be of purely academic interest. Higher education involves global academic networking and infrastructures that can provide global knowledge and educational resources. Higher education policies should balance immediate economic needs with long-term societal development, while also encouraging knowledge production. Policy-makers must deal with public concerns about immediate economic needs as well as knowledge production, which sometimes require long-term developmental support and encouragement. The immediate short-term research outcomes or quantitative approaches that measure the performance of a higher educational institution--such as number of papers produced, patents benefits gained, and profits from

projects--may not able to truly evaluate an institution's contribution to academic development and society. Again, critical perspectives on and awareness of balancing long-term academic development and socioeconomic needs are important for policy-makers when making political decisions.

Future research

The method of co-plot can be used in studies to indicate the picture of how a country performs in open education and creative economy, compared to other countries, to provide global understanding for future development. The co-plot offers efficient visual displays and comparisons among variables and cases. It can give an overall, general perspective of global performance, which may be helpful for initiating research projects and conducting new policies. Additionally, reveal the details about the performances and differences among countries, based on which more in-depth researches can be developed.

Further comparative studies on global policies may be conducted in the future. For example, the United Kingdom, the Republic of Korea, and Norway have some success in developing their creative economies as a result of long-term planning, owing to the support from the government. Some of their policies and experience can be good potential topics for study. Analyses of local creative economies, open education needs, and related policies and programs may also be conducted by future researchers. For example, an evaluation of Taiwan's creative economic policies and the economic results they produce is one possibility.

The study on local cultural creative industries and the education in cultural creativity are important issues to study. In sum, the conceptions of open education, creative economy, globalization, and knowledge economy and their implications are getting crucial in higher education and general education. The research on these topics should be further conducted.

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Appendix A
The World Bank KAM Variables

The following definitions of variables and descriptions are directly quoted and organized from the World Bank website on KAM. “Please note that some variables come from the World Bank's internal database Development Data Platform (DDP). Whenever possible, we provide the source of the original data.”(the World Bank)

Overall performance of the economy

Average Annual Gross Domestic Product (GDP) Growth, 1993-97 and 2003-2007 (%) (DDP) Annual GDP growth is a good indicator of a country's overall economic development. World Bank and OECD national accounts data.

Gross Domestic Product (GDP) Per Capita, 2007 (international current PPP $) (DDP) World Bank and OECD national accounts data.

Gross Domestic Product (GDP) (current US$ bill.), 2007 (DDP) World Bank and OECD national accounts data.

Human Development Index (HDI), 2005 (UNDP Human Development Report 2007/2008) Table 1. The HDI provides information on the human development aspect of economic growth. The HDI is based on three indicators: longevity, as measured by life expectancy at birth; educational attainment, as measured by a combination of adult literacy rate and the combined gross primary, secondary and tertiary enrollment ratio; and standard of living, as measured by GDP per capita (Purchasing Power Parity US$).

Poverty Index, 2005 (UNDP Human Development Report 2007/2008) Tables 3 & 4. The Index for developing countries concentrates on deprivations in three essential dimensions of human life – longevity, literacy and a decent standard of living (as measured by percentage of population without sustainable access to an improved water resource and children under weight for age).

The Index for developed countries, Eastern Europe and CIS concentrates on deprivations in three essential dimensions of human life - longevity, literacy and a decent standard of living (as measured by percentage of population below income poverty line). In addition, it captures social exclusion, as measured by the rate of long-term unemployment. Income poverty refers to the percentage of the population living on less than 50% of median disposable household

income.

Composite Risk Rating, Aug 2007- July 2008 (monthly average) (International Country Risk Guide). The rating is an overall index, ranging from 0 to 100, based on 22 components of political, financial and economic risk: very high risk (00.0 to 49.9), high risk (50.0 to 59.9), moderate risk (60.0 to 69.9), low risk (70.0 to 79.9), and very low risk (80.0 to 100).

The economic regime

Gross Capital Formation as % of GDP (Average), 2003-2007 (DDP) GCF consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. World Bank and OECD national accounts data.

Trade as % of GDP, 2007 (DDP) The sum of exports and imports of goods and services, measured as a share of GDP. World Bank and OECD national accounts data.

Tariff & Nontariff Barriers, 2009 (Heritage Foundation) This is a score assigned to each country based on the analysis of its tariff and non-tariff barriers to trade, such as import bans and quotas, as well as strict labeling and licensing requirements. The score is based on the Heritage Foundation's Trade Freedom score.

Intellectual Property Protection, 2008 (WEF Global Competitiveness Report 2008-2009). Table 1.02. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether intellectual property protection is strong in their country (1= weak or nonexistent, 7 = is equal to the world's most stringent).

Soundness of Banks, 2008 (WEF Global Competitiveness Report 2008-2009). Table 8.07. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country responding to the question of whether "banks are generally sound" in their country. (1= insolvent and may require government bailout, 7= generally healthy with sound balance sheets).

Exports of Goods and Services as % of GDP, 2007 (DDP) This includes the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. This excludes labor and property income as well as transfer payments. World Bank and OECD national accounts data.

Interest Rate Spread (lending rate minus deposit rate), 2007 (DDP) The interest rate charged by banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. International Monetary Fund, International Financial Statistics and data files.

Intensity of Local Competition, 2008 (WEF Global Competitiveness Report 2008-2009). Table 6.01. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether competition in local markets is intense in their country. (1= limited in most industries and price-cutting is rare, 7 = intense and market leadership changes over time).

Domestic Credit to Private Sector (% of GDP), 2007 (DDP). Indicator refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment. For some countries these claims include credit to public enterprises. International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.

Cost to Register a Business (% of GNI per capita), 2009 (Doing Business). Official costs of business registration.

Days Required to Start a Business, 2009 (Doing Business). Duration of all procedures required to register a firm.

Cost to Enforce a Contract (% of debt), 2009 (Doing Business). Cost in court fees and attorney fees, in which the use of attorneys is mandatory or common, expressed as a percentage of the debt value.

Governance

Regulatory Quality, 2007 (Governance Indicators, World Bank). This indicator measures the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development.

Rule of Law, 2007 (Governance Indicators, World Bank). This indicator includes several indicators which measure the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of violent and non-violent crime,

the effectiveness and predictability of the judiciary, and the enforceability of contracts.

Government Effectiveness, 2007 (Governance Indicators, World Bank). This indicator combines into one grouping perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies.

Voice and Accountability, 2007 (Governance Indicators, World Bank). This is a composite indicator and comprises a number of individual indicators measuring various aspects of the political process, civil liberties and political rights. This index measures the extent to which citizens of a country are able to participate in the selection of governments. Also included are indicators measuring the independence of the media, which serves an important role in monitoring those in authority and holding them accountable for their actions.

Political Stability, 2007 (Governance Indicators, World Bank). This index combines several indicators which measure perceptions of the likelihood that the government in power will be destabilized or overthrown by possibly unconstitutional means and/or violent means. This index captures the idea that the quality of governance in a country is compromised by the likelihood of wrenching changes in government, which not only has a direct effect on the continuity of policies, but also at a deeper level undermines the ability of the citizens to peacefully select and replace those in power.

Control of Corruption, 2007 (Governance Indicators, World Bank). This indicator corresponds to "graft" measures of corruption. Notably, corruption measured by the frequency of "additional payments to get things done" and the effects of corruption on the business environment.

Press Freedom, 2008 (Freedom House). The cumulative score of the degree of press freedom in a country. Countries scoring 0 to 30 are regarded as having "Free" media, 31-60, "Partly Free" media and 61 to 100, "Not Free" media.

The innovation system

FDI Outflows as % of GDP, 2003-07 (average) (UNCTAD). Outflows of FDI in the reporting economy comprise capital provided (either directly or through other related enterprises) by a company resident in the economy (foreign direct investor) to an enterprise resident in another country.

FDI Inflows as % of GDP, 2003-07 (average) (UNCTAD). Inflows of FDI in the reporting economy comprise capital provided (either directly or through other related enterprises) by a foreign direct investor to an enterprise resident in the economy.

Royalty and License Fees Payments, (US$ millions), 2007 (DDP). These are payments between residents and nonresidents for the authorized use of intangible, non-produced, non-financial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes, such as manuscripts and films. International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

Royalty and License Fees Payments (US$ millions) Per Million Population, 2007 (DDP). This is the variable above, weighted by million population per country.

Royalty and License Fees Receipts (US$ millions), 2007 (DDP). These are receipts between residents and nonresidents for the authorized use of intangible, non-produced, non-financial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes (such as manuscripts and films). International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

Royalty and License Fees Receipts (US$ millions) Per Million Population, 2007 (DDP). This is the variable above, weighted by million population.

Royalty and License Fees Payments and Receipts (US$ millions), 2007 Royalty and License Fees Payments (US$ mil.) + Royalty and License Fees Receipts (US$ mil.).

Royalty and License Fees Payments and Receipts (US$ millions) Per Million Population, 2007, Royalty and License Fees Payments (per mil pop.) + Royalty and License Fees Receipts (per million population).

Science and Engineering Enrollment Ratio, 2007 (as % of tertiary enrollment students) (UNESCO). This includes the fields of science (except social science), engineering, manufacturing and construction.

Science Enrollment Ratio, 2007 (as % of tertiary enrollment students) (UNESCO). This includes the field of science only, except social science.

Researchers in R&D, 2006 (UNESCO). The total number of researchers engaged in R&D, as reported in the selected R&D indicators section of the UNESCO yearbook.

Researchers in R&D Per Million Population, 2006 (UNESCO). This is the variable above, weighted by million population.

Total Expenditure for R&D as % of GDP, 2006 (UNESCO). Included are fundamental and applied research and experimental development work leading to new devices, products, and processes.

Manufacturing Trade as Percentage of GDP, 2006 (DDP). The total volume of manufactured exports and imports over the total GDP. World Trade Organization, International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

University-Company Research Collaboration, 2008 (WEF Global Competitiveness Report 2008-2009) Table 12.04. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country responding to the question of whether companies' collaboration with local universities in research and development activities in their country is (1= minimal or nonexistent, 7= intensive and ongoing).

Scientific and Technical Journal Articles, 2005 (DDP). This refers to scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. National Science Foundation, Science and Engineering Indicators.

Scientific and Technical Journal Articles Per Million Population, 2005 (DDP). This is the variable above, weighted by million population.

Availability of Venture Capital, 2008 (WEF Global Competitiveness Report 2008-2009) Table 8.04. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether entrepreneurs with innovative but risky projects can generally find venture capital in their country. (1= not true, 7= true).

Patent Applications Granted by the USPTO, average for 2003-07 (USPTO). Shows the number of U.S. patent documents (i.e., utility patents, design patents, plant patents, reissue patents, defensive publications, and statutory invention registrations) granted.

Patent Applications Granted by the USPTO Per Million People, average for 2003-07

(USPTO). This is the variable above, weighted by million population.

High-Technology Exports as % of Manufactured Exports, 2006 (DDP). High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

Private Sector Spending on R&D, 2008 (WEF Global Competitiveness Report 2008-2009), Table 12.03. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country responding to the question of whether companies spend heavily on research in their country. (1= do not spend, 7 = spend heavily relative to international peers).

Firm-Level Technology Absorption, 2008 (WEF Global Competitiveness Report 2008-2009), Table 9.02. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country responding to the question of whether the companies in your country are (1= not able to absorb new technology, 7 = aggressive in absorbing new technology).

Value Chain Presence, 2008 (WEF Global Competitiveness Report 2008-2009), Table 11.05. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether exporting companies in your country are (1 = primarily involved in resource extraction or production, 7 = not only produce but also perform product design, marketing sales, logistics, and after-sales services).

Capital Goods Gross Imports (US$ million), 2003-07 average (World Integrated Trade Solution). The indicator can be derived from disaggregated international trade statistic within section 7 of the Standard Trade Classification (SITC). One can usually excludes consumer goods such as domestic appliances, television receivers, ratios and broadcast receivers, passenger motor cars and chassis, and motor cycles and bicycles.

Capital Goods Gross Exports (US$ million), 2003-07 average (World Integrated Trade Solution). The indicator can be derived from disaggregated international trade statistic within section 7 of the Standard Trade Classification (SITC). One can usually excludes consumer goods, such as domestic appliances, television receivers, ratios and broadcast receivers, passenger motor cars and chassis, and motor cycles and bicycles.

S&E articles with foreign coauthorship (%), 2005. This refers to the share of published S&E articles which have foreign coauthors. It is calculated by dividing the number of papers a specific country participated in with one or more foreign institutional authors by the total number of papers the specific country participated in. Article counts from the set of journals

covered by the Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Articles classified by tape year (the year they entered the database), rather than the year of publication, and assigned to region/country/economy on basis of institutional address(es) listed on article. Articles on whole-count basis, i.e., each collaborating region/country/economy credited one count. Sources: Thomson Reuters, SCI and SSCI; The Patent Board; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Average number of citations per S&E article, 2005 Citation counts from set of journals covered by Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Articles classified by tape year (the year they entered the database), rather than the year of publication, and assigned to region/country/economy on basis of institutional address(es) listed on the article. Citations on fractional-count basis, i.e., for articles with collaborating institutions from multiple countries/economies, each country/economy receives fractional credit on basis of proportion of its participating institutions. Citation counts based on 3-year period with 2-year lag, e.g., citations for 2005 are references made in articles in 2005 data tape to articles in 2001-03 data tapes. The average number of citations per published S&E article for 2005 is the total number of citations referred in S&E articles in 2005 tape year divided by the number of S&E articles in 2001, 2002 and 2003 tape year. Source: Thomson Reuters, SCI and SSCI; The Patent Board; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Education

Adult Literacy Rate (%, age 15 and above), 2007 (UNESCO). Adult literacy rate is the percentage of people ages 15 and above who can, with understanding, read and write a short, simple statement on their everyday life.

Average Years of Schooling, 2000 (15 years old and above) (2007 WDI), Table 2.13. This variable is used as an aggregate measure of the educational stock in a country.

Secondary Enrollment (% gross), 2007 (UNESCO). The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

Tertiary Enrollment (% gross), 2007 (UNESCO) The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

Life Expectancy at Birth, 2007 (DDP). The number of years a newborn infant would live if prevailing patterns of mortality at its time of birth were to stay the same throughout its life.

Internet Access in Schools, 2008 (WEF Global Competitiveness Report 2008-2009), Table 5.06. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether internet access in schools in their country is (1= very limited, 7= pervasive-most children have frequent access).

Public Spending on Education as % of GDP, 2006 (DDP). This consists of public spending on public education, plus subsidies to private education at the primary, secondary, and tertiary levels.

4th Grade Achievement in Mathematics, 2007 (Trends in International Mathematics and Science Study, TIMSS). This is based on the score assigned to the performance of 4th grade students on a standardized mathematics test.

4th Grade Achievement in Science, 2007 (Trends in International Mathematics and Science Study, TIMSS). This is based on the score assigned to the performance of 4th grade students on a standardized science test. [repeats above listing]

8th Grade Achievement in Mathematics, 2007 (Trends in International Mathematics and Science Study, TIMSS). This is based on the score assigned to the performance of 8th grade students on a standardized mathematics test.

8th Grade Achievement in Science, 2007 (Trends in International Mathematics and Science Study, TIMSS). This is based on the score assigned to the performance of 8th grade students on a standardized science test. [repeats above listing]

Quality of Science and Math Education, 2008 (WEF Global Competitiveness Report 2008-2009), Table 5.04. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether math and science education in your country’s schools (1 = lag far behind most of the countries, 7 = are among the best in the world).

Quality of Management Education, 2008 (WEF Global Competitiveness Report 2008-2009), Table 5.05. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, asked to rate the "quality of local management schools" (1= limited or of poor quality, 7 = among the world's best).

15-year-olds' math literacy, 2006 (OECD Program for International Student Assessment, PISA). Scores of 15-year-old students in mathematics literacy in 2006.

15-year-olds' science literacy, 2006 (OECD Program for International Student Assessment, PISA). Scores of 15-year-old students in science literacy in 2006.

Labor

Unemployment Rate (% of total labor force), 2007 (DDP) The share of the labor force that is without work but available for and seeking employment. International Labour Organization.

Employment in Industry (% of total employment), 2005 (DDP). The proportion of total employment recorded as working in the industrial sector. Industry includes mining and quarrying (including oil production), manufacturing, electricity, gas and water, and construction.

Employment in Services (% of total employment), 2005 (DDP). The proportion of total employment recorded as working in the services sector. Services include wholesale and retail trade and restaurants and hotels; transport, storage, and communications; financing, insurance, real estate, and business services; and community, social, and personal services.

Professional and Technical Workers as % of the Labor Force, 2007 (2009 ILO Yearbook of Labor Statistics). This involves calculation of total number of technical and professional workers as a percentage of the labor force. Data were obtained from Table 2C - Total employment, by occupation.

Extent of Staff Training, 2008 (WEF Global Competitiveness Report 2008-2009), Table 5.08. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether "in your country, the general approach to human resources is to invest" (1= little in training and development, 7 = heavily to attract, train, and retain staff).

Brain Drain, 2008 (WEF Global Competitiveness Report 2008-2009), Table 7.09. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, asked to rate whether the country's talented people (1= normally leave to pursue opportunities in other countries, 7= almost always remain in the country).

Cooperation in labor-employer relations, 2008 (WEF Global Competitiveness Report 2008-2009). Labor-employer relations in your country are (1 = generally confrontational, 7 = generally cooperative).

Flexibility of wage determination, 2008 (WEF Global Competitiveness Report 2008-2009). In your country, wages are (1 = set by a centralized bargaining process, 7 = up to each individual company).

Pay and productivity, 2008 (WEF Global Competitiveness Report 2008-2009). In your country, pay is (1 = not related to worker productivity, 7 = strongly related to worker productivity).

Reliance on professional management, 2008 (WEF Global Competitiveness Report 2008-2009). Senior management positions in your country are (1 = usually held by relatives or friends without regard to merit, 7 = mostly held by professional managers chosen for their superior qualification).

Local availability of specialized research and training services, 2008 (WEF Global Competitiveness Report 2008-2009). In your country, specialized research and training services are (1 = not available, 7 = available from world-class local institutions).

Difficulty of hiring index, 2009 (Doing Business). Applicability and maximum duration of fixed-term contracts and minimum wage for trainee or first-time employee. Higher values indicate more rigid regulations.

Rigidity of hours index, 2009 (Doing Business). Scheduling of nonstandard work hours and annual paid leave.

Difficulty of firing index, 2009 (Doing Business). Notification and approval requirements for termination of a redundant worker or a group of redundant workers, obligation to reassign or retrain and priority rules for redundancy and reemployment.

Firing cost, 2009 (Doing Business). Notice requirements, severance payments and penalties due when terminating a redundant worker, expressed in weeks of salary.

Labor tax and contributions (%), 2009 (Doing Business). Amount of taxes and mandatory contributions on labor, paid by the business as a percentage of commercial profits. This amount includes mandatory social security contributions paid by the employer, both to public

and private entities, as well as other taxes or contributions related to employing workers.

Employment to population ratio, 15+, total (%), 2007 (DDP). The proportion of a country's population that is employed. Ages 15 and older are generally considered the working-age population.

Employment to population ratio, ages 15-24, total (%),
2007 (DDP). Employment-to-population ratio is the proportion of a country's population that is employed. Ages 15-24 are generally considered the youth population.

Unemployment with tertiary education, total (% of total unemployment),
2007 (DDP). Unemployment by level of educational attainment shows the unemployed by level of educational attainment, as a percentage of the unemployed.

Unemployment with secondary education, total (% of total unemployment), 2007 (DDP). Unemployment by level of educational attainment shows the unemployed by level of educational attainment, as a percentage of the unemployed.

Labor force participation rate, total (% of total population, age 15-64), 2007 (DDP). Labor force participation rate is the proportion of the population ages 15-64 that is economically active: all people who supply labor for the production of goods and services during a specified period.

Labor force with tertiary education (% of total), 2005 (DDP). Labor force with tertiary education is the proportion of labor force that has a tertiary education, as a percentage of the total labor force.

Labor force with secondary education (% of total), 2005 (DDP). Labor force with secondary education is the proportion of the labor force that has a secondary education, as a percentage of the total labor force.

Firms offering formal training (% of firms), 2007 (DDP). Firms offering formal training are the percentage of firms offering formal training programs for their permanent, full-time employees.

Gender

Gender Development Index, 2005 (UNDP Human Development Report 2007/2008), Table 28.

The Index uses the same variables as the Human Development Index. The difference is that the GDI adjusts the average achievement of each country in life expectancy, educational attainment and income in accordance with the disparity in achievement between women and men.

Females in Labor Force (% of total labor force), 2007 (DDP). Labor force comprises all people who meet the International Labor Organization's definition of an economically active population. International Labour Organization.

Seats in Parliament Held by Women (as % of total), 2007 (UNDP Human Development Report 2007/2008), Table 29. This refers to jobs (?) held by women in a lower or single house or an upper house or senate, where relevant.

School Enrollment, Secondary, Female (% gross), 2007 (UNESCO). The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

School Enrollment, Tertiary, Female (% gross), 2007 (UNESCO). The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

Information and communication technology

Telephones per 1,000 people, 2007 (telephone mainlines + mobile phones) (ITU).

Telephone mainlines per 1,000 people, 2007 (ITU). Telephone mainlines are telephone lines connecting a customer's equipment to the public switched telephone network.

Mobile phones per 1,000 people, 2007 (ITU). Mobile telephone subscribers are subscribers to a public mobile telephone service, using cellular technology.

Computers per 1,000 persons, 2007 (ITU). Personal computers are self-contained computers designed to be used by a single individual.

TV households with television, 2006. (DDP) are the share of households with a television set. Some countries report only the number of households with a color television set, and therefore the true number may be higher than reported. International Telecommunication Union, World Telecommunication Development Report and Database, and the World Bank

estimates.

Daily newspapers per 1,000 people, 2004 (total average circulation or copies printed) (DDP) Table 5.11. Daily newspapers refer to those published at least four times a week.

International Internet Bandwidth, 2007 (WDI). This is the contracted capacity of international connections between countries for transmitting Internet traffic. International Telecommunication Union, World Telecommunication Development Report and database, and the World Bank estimates.

Internet users per 1,000 people, 2007 (ITU). The indicator relies on nationally reported data. In some cases, it is based on national surveys (they differ across countries in the age and frequency of use they cover); in others it is derived from reported Internet Service Provider subscriber counts.

Price basket for Internet, US$ per month, 2006 (WDI). This is calculated based on the cheapest available tariff for accessing the Internet, 20 hours a month (10 hours peak and 10 hours off-peak). The basket does not include the telephone line rental, but does include telephone usage charges if applicable. International Telecommunication Union, World Telecommunication Development Report and database.

Availability of e-Government Services, 2008 (WEF The Global Information Technology Report 2008/2009), Table 9.02. This is based on a large sample group in a particular country, responding to the question of whether the "online government services, such as personal tax, car registration, passport, business permit, and e-procurement are (1 = not available, 7 = extensively available) (1= low, 7 = high).

Extent of business Internet use, 2006 (WEF Global Competitiveness Report 2006/2007), Table 3.16. This is based on the statistical score on a 1-7 scale of a large sample group in a particular country, responding to the question of whether Internet use by businesses in your country to buy/or sell products and services are (1 = very low, 7 = very widespread).

ICT Expenditure as % of GDP, 2007 (DDP). Information and communications technology (ICT) expenditures include external spending on information technology ("tangible" spending on information technology products purchased by businesses, households, governments, and education institutions from vendors or organizations outside the purchasing entity), internal spending on information technology ("intangible" spending on internally customized software, capital depreciation, and the like), and spending on telecommunications and other

office equipment. World Information Technology and Services Alliance, Digital Planet 2004: The Global Information Economy, and Global Insight, Inc.