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ABSTRACT: Nations and organizations are becoming increasingly dependent on each other in the pursuit for global peace, eradication of poverty, environmental sustainability, and a healthy and meaningful work-life balance. Thus, human resource development (HRD) professionals, who are already prepared and equipped to foster environments for learning and change at the individual, team and organizational levels will have to increase their involvement at the societal level and play a strategic role in the development of innovative national human resource development systems that are appropriate for the global context. The purpose of this conceptual paper is to discuss the innovative capacities of nations based on their Global Innovation Index (INSEAD, 2011) and to review the national workforce development policies, including sourcing, developing talent and retaining global talent, of countries that have ranked high on the global innovation index (including BRIC). The paper concludes with recommendations for HRD research, practice and education as it relates to national human resource development (NHRD).

KEY WORDS: National human resource development, human resource development, workforce development, global talent, innovation

As nations recognize the power of building innovation capacity, it is becoming increasingly necessary to have a systemic approach to human resource development at the national level, keeping the global context in mind (Ashton, 2001; Ashton & Green, 1996). Given the demographic forecast (Manpower, 2006), that in the next five years there will be workforce shortages in some countries (e.g., the United States and European countries) and a surplus of workforce in others [e.g., BRIC; for example, India’s workforce is projected to grow by 335 million people by the year 2030 which is almost equivalent to the entire European and American workforce today (The National Academies, 2005)], nations around the world will have to develop comprehensive strategies that will take a systemic approach to human resource development for innovation through progressive education reforms and workforce development policies that are targeted to face these challenges. Education and investment in the skill development of members of their society is therefore more critical to nations than ever before (Thurow, 1996).

Innovation is an important factor for economic progress and competitiveness of nations. Traditionally innovation has been measured by the number of Ph.D.s, the number of research articles produced, the research centers created, the patents issued and research and development expenditures. As more nations are putting innovation at the center of their growth strategies, there is a greater need to understand the different forms of innovation and measure their impact. The Global Innovation Index (GII) project, launched by INSEAD in 2007, has developed a metrics to better capture the richness of
innovation and had published reports every year since 2009 to offer a glimpse of the comparative strengths of nations on innovativeness.

The purpose of this conceptual paper is to discuss the innovative capacities of nations based on their Global Innovation Index (INSEAD, 2011) and to review the national workforce development policies, including sourcing, developing talent and retaining global talent, of countries that have ranked high on the global innovation index (including BRIC). This paper is guided by the belief that the development and effective utilization of human skills and knowledge contributes to the wealth of a nation and is necessary for social and political progress (Harbison, 1971; Harbison & Myers, 1964).

This paper is organized in two sections on innovation and human resource development. It includes the examination of the human resource development policies, focusing on workforce development policies, of a few countries on the basis of their strength on the GII, to understand how they contributed to building their innovation capacity. The paper concludes with recommendations for HRD research, practice and education as it relates to national human resource development (NHRD).

**Innovation**

Innovation drives economic development and is an important factor for competitiveness of nations. It involves a dynamic process of “creative destruction” and is manifested in different types of innovation such as: introduction of a new product or a qualitative change in an existing product; process innovation new to an industry; the opening of a new market; development of new sources of supply for raw materials or other inputs; and changes in industrial organization (Schumpeter, 1934).

The Oslo Manual (OECD, 2005) provides the following broad definition of innovation that encompasses a wide range of possible innovations: “An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organisation or external relations” (p. 46). The meaning of these innovations is presented below.

- A **product innovation** is “the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics” (p.48).
- A **process innovation** is “the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software” (p. 49).
- A **marketing innovation** is “the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing” (p. 49).
- An **organizational innovation** is “the implementation of a new organizational method in the firm’s business practices, workplace organisation or external relations” (p.51).

Enhancing innovation and competitiveness of nations can be achieved only by understanding the complex set of relationships among actors in the system. Businesses, universities and government research institutions are all key players in
enhancing innovation of nations. Networking among these actors and institutions and understanding the linkages between them is critical to enhancing innovation capacity.

This premise, that a web of interaction between actors involved in innovation enhances innovative performance of a nation, is the basis of the national innovation systems. In the absence of a single, commonly accepted definition of these systems, some widely accepted definitions are captured in Table 1.

Table 1: Definitions of National Innovation Systems

<table>
<thead>
<tr>
<th>Definition of a National Innovation System</th>
<th>Source</th>
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<tbody>
<tr>
<td>“. . the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies.”</td>
<td>Freeman, 1987, p. 1</td>
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<td>“. . the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state.”</td>
<td>Lundvall, 1992, p.12</td>
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<td>“. . . a set of institutions whose interactions determine the innovative performance . . . of national firms.”</td>
<td>Nelson, 1993, p.4</td>
</tr>
<tr>
<td>“that set of institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process”</td>
<td>Metcalfe, 1999, p. 38</td>
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Recognizing that innovation is an important factor for economic progress, more and more nations are putting innovation at the center of their growth strategies. Thus there is a greater need to understand the different forms of innovation and measure their impact. The Global Innovation Index (GII) project, launched by INSEAD in 2007, has developed a metrics to better capture the richness of innovation and have published reports every year since 2009 to offer a glimpse of the comparative strengths of nations on innovativeness. This paper will use the GII framework (Figure 1) to compare nations on their innovation strength.

The GII is calculated as the simple average of two sub-indices, the Innovation Input Sub-Index and the Innovation Output Sub-Index. The Innovation Input Sub-Index gauges elements of the national economy that enable innovative activities, grouped in five pillars: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication. The Innovation Output Sub-Index captures actual evidence of innovation outputs, divided in two pillars: (6) Scientific
National Human Resource Development

The development and effective utilization of human skills and knowledge contributes to the wealth of a nation and is necessary for social and political progress (Harbison, 1971; Harbison & Myers, 1964). As we look through the annals of history, though, this belief was not always enacted. Advances in human productivity have been made on the basis of exploitation of human labor, technological innovation, and the amassment of material wealth (Ashton & Green, 1996). The twenty-first century opened a new chapter in human history where the future will belong to societies that can organize themselves for learning and acting on what they learn (Marshal & Tucker, 1992), and the development of large numbers in the workforce, through education and training will become “the key item in the struggle for competitive superiority” (Ashton & Green, 1996, p. 1). Thus countries around the world must realize that talent development is critical for innovation and sustainable economic growth (Ashton, 2002) and that “the road to economic growth and development is tied to the skill formation of their human capital” (Zidan, 2001, p. 440).
Several countries have recognized the need to move beyond manpower planning and human capital investment to National Human Resource Development (NHRD), a broader, synthesized approach to such planning based on open systems thinking (McLean, Bartlett, & Cho, 2003). Countries around the world have explored various national models of talent development to formulate policies that impact their economic, social, cultural, and educational systems (Cho & McLean, 2004).

Cho and McLean (2004) suggest five models of NHRD as countries are becoming increasingly involved with formulating national policies to develop robust human resource development (HRD) systems. The emerging NHRD models are: (a) centralized NHRD, (b) transitional NHRD, (c) government-initiated NHRD, (d) decentralized/freemarket NHRD, and (e) small-nation NHRD. They caution that there is no "pure" model; each country may bring in components from other countries. Each of these models is explained below:

Under the centralized model, the state adopts a top-down approach to provide education and training as in the case of China. The central government is responsible for planning, implementing, and assessing HRD policies and strategies and there may not be other serious agencies taking an active role in policy setting. Typically, there is a strong interest in the social dimension of HRD and this model has strong social and moral implications. Thus the government plays a major role in economic development as compared to businesses.

In the decentralized/free-market model, competitive forces from the market drive HRD efforts. The private sector plays a significant role in education and training, relying on state support mostly in an indirect way. The foundational values of this model are individualistic, believing that individuals are responsible for their own learning and growth. Canada and the USA present models that fit into this category.

The UK offers a government-initiated model of NHRD where various HRD initiatives have been taken by the government, primarily in a consultative manner, based on a stakeholder view of HRD and the economy. Under this model there is a move toward standardization. The UK model exerts influence on former territories such as South Africa, Australia and others in many respects, if not all.

A transitional model applies to countries transitioning from the centralized model to a government-initiated model or a decentralized model. Employers, unions and the government work together to ensure there is agreement over the strategies and necessary steps for implementing the NHRD policies. Korea is an example of a country that follows this model. Singapore has a human capital development plan featuring a committed government, a network of agencies, and a commitment to tripartism (Osman-Gani, 2004), but also has central systems that aim to standardize, and thus its model may be considered to lie between the transitional model and the government-initiated model.

A small-nation model is important to consider because the majority of nations in the world fit into the small-nation category. Under this model small nations cooperate with other small nations in the region to gain the benefit of pooling resources. Participative processes are possible because the nations are small, and people from different sectors can come together. There are several nations in the Pacific Islands that follow this model, with regional intergovernmental organizations playing an important role in promoting NHRD for the region (Bartlett & Rodgers, 2004).
Table 1 below shows the scores and ranks of the first 20 countries on the Global Innovation Index.

Table 1: Global Innovation Index Rankings of the first 20 Countries

<table>
<thead>
<tr>
<th>Country/Economy</th>
<th>Score (0–100)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>63.82</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>62.12</td>
<td>2</td>
</tr>
<tr>
<td>Singapore</td>
<td>59.64</td>
<td>3</td>
</tr>
<tr>
<td>Hong Kong (SAR), China</td>
<td>58.80</td>
<td>4</td>
</tr>
<tr>
<td>Finland</td>
<td>57.50</td>
<td>5</td>
</tr>
<tr>
<td>Denmark</td>
<td>56.96</td>
<td>6</td>
</tr>
<tr>
<td>United States of America</td>
<td>56.57</td>
<td>7</td>
</tr>
<tr>
<td>Canada</td>
<td>56.33</td>
<td>8</td>
</tr>
<tr>
<td>Netherlands</td>
<td>56.31</td>
<td>9</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>55.96</td>
<td>10</td>
</tr>
<tr>
<td>Iceland</td>
<td>55.10</td>
<td>11</td>
</tr>
<tr>
<td>Germany</td>
<td>54.89</td>
<td>12</td>
</tr>
<tr>
<td>Ireland</td>
<td>54.10</td>
<td>13</td>
</tr>
<tr>
<td>Israel</td>
<td>54.03</td>
<td>14</td>
</tr>
<tr>
<td>New Zealand</td>
<td>53.79</td>
<td>15</td>
</tr>
<tr>
<td>Korea, Rep.</td>
<td>53.68</td>
<td>16</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>52.65</td>
<td>17</td>
</tr>
<tr>
<td>Norway</td>
<td>52.60</td>
<td>18</td>
</tr>
<tr>
<td>Austria</td>
<td>50.75</td>
<td>19</td>
</tr>
<tr>
<td>Japan</td>
<td>50.32</td>
<td>20</td>
</tr>
</tbody>
</table>

Since a detailed review of the innovation indices of each of these countries will not be possible, only some of these countries will be discussed in this paper. Among the European countries, Sweden, along with Finland, Denmark and Norway will be discussed as a Nordic/Scandinavian cluster as they exhibit several similarities within themselves, and are quite distinct from other European countries. Germany is worth examining for its traditional stature of prominence within the European Union, as is Ireland for its relatively recent rise to prominence as a highly innovative nation. Singapore’s innovation index and exemplary national human resource development policies will be reviewed in detail. The USA is a country worth examining since it is the only large country in size and population that maintains its position as an innovation leader. The Republic of Korea has demonstrated remarkable success in building
innovative capacity through its systematic approach to human resource development at a national level. Finally the BRIC countries (Brazil, China, India) will be examined; each of them being leaders in innovation in their respective regions.

The review of each country will open with an analysis of its strength on various GII indicators. This will be followed by an examination of the human resource development policies of these countries that have enabled them to demonstrate such remarkable achievements in innovation and global competitiveness. Although education is certainly an important aspect of human resource development and a key determinant of the human capital of a nation, for purposes of this paper we will pay special attention to the workforce context and focus on workforce development policies including policies for sourcing global talent, developing and retaining talent.

**Nordic/Scandinavian Countries**

Sweden is ranked 2nd in the overall GII rankings, and is among the most efficient innovators. With a knowledge-based economy, Sweden leads the GII rankings on Scientific Outputs, and is ranked 2nd on Creative Outputs. It also scores highly on the Input side with top ten positions on political environment, education, R&D, ICT, energy, investment, and knowledge workers. Finland balances both input and output to be ranked 6th in the overall GII rankings. Denmark is ranked 6th. Iceland is 11th and Norway is 18th (INSEAD, 2011).

There is much in common among the Nordic/Scandinavian countries when it comes to workforce development. They have demonstrated greater success in learning-oriented work programs than Europe in general, and this can be ascribed to the cooperation between the labor market parties and the national political authorities leading to trust between management and workers at a local level (Gustavsen, 2007). Norway and Sweden have experimented with job redesign and efforts to enhance workplace democracy since the 1960s (Alasoini, 2009). In Sweden, action research was used in developing networks in a national work reform program called the Leadership, Organization and Co-determination (LOM) program (Engelstad & Gustavsen, 1993). Workplace development is now better integrated in the overall innovation and regional policy context under the aegis of VINNOVA, the Swedish Governmental Agency for Innovation Systems, which invests in research and strengthens Sweden’s innovative capacity for competitiveness, sustainable development and growth (Alasoini, 2009).

The tradition of action research, that saw development as the creation of a discourse formation, in programs such as LOM, were the inspiration for Enterprise Development 2000 in Norway to facilitate workforce development through ‘democratic dialogue’ and ‘discourse formation’ (Gustavsen, 2001). More recently Norway has been guided by the Value Creation 2010 program to develop new forms of cooperation and work organization through strong social partnerships (Alasoini, 2009).

Another Nordic country, Finland has strengthened its position on workforce development in recent years through the Finnish Workplace Development Programme (TYKES), which supports the development of working practices in Finland, under the auspices of the Finnish Funding Agency for Technology and Innovation (TEKES). TYKES is based on the view that for a small country like Finland to cope with the globalizing economy, the most effective way of generating workplace innovation is through close cooperation and interaction between workplaces, researchers,
consultants, public authorities and social partners. One of the main strengths of this strategy is the balanced process and design orientation of project activities (Alasoini, 2009). Equally important is its inclusiveness to all sectors of the economy. Finland has recognized its shortcomings in having the necessary mechanisms for promoting horizontal networking between workplaces, and is now giving increased attentions to networks as a medium for information dissemination and knowledge creation (Alasoini, 2009). Finland’s large-scale eco-system model (Kao, 2009) of developing end-to-end innovation systems combining stewardship mechanisms, funding bodies, research institutions, and structures for business and academic collaboration, all in support of an overall national strategy has been very successful. The self-contained environment that Finland provides, being a small country, lends itself to strong networking (Kao, 2009).

Germany

Germany, a high income European country, ranked 12th on the overall GII, has an excellent performance on the Output sub-index, but is relatively weak on the input side. Its biggest strength is in resident patent application, but its high GII score is due to a good balance, being well positioned on almost all indicators (INSEAD, 2011).

Workforce development strategies in Germany have been different from those of the Scandinavian countries in many ways. They have focused on technological and organizational designs rather than on participatory processes at the workplace to encourage innovation (Alasoini, 2009). Germany has had various programs for workforce development since the Humanization of Work program in the 1970s. In 2001, the Federal Ministry of Education and Research launched a new five-year Framework Concept, ‘Innovative Development of Work – The Future of Work’, to cope with new demands placed by demographic, technological and organizational changes on employees and companies. The program has renewed and improved upon itself by boosting horizontal networking between workplaces through project activities (Alasoini, 2009).

Ireland

Ireland ranks 13th on the overall GII. It is ranked in the top 10 on the Innovation Input sub-index, due to its excellent scores in Institutions and Market and Business sophistication. However, it still lags behind on the Output sub-index in spite of a good environment and potential for innovation. Ireland, owes its success to the strong political backing it receives. The National Workplace Strategy, which represents the strategic approach of the Government in strengthening Ireland’s competitiveness as a knowledge-based economy, recommends a range of initiatives and interventions (Figure 2) to support workplace innovation at the enterprise level.
The United States of America (USA)

USA is ranked 7th in the GII, which is commendable considering its large size and population. In fact, it is the only large country in the top 10 GII rankings. It has a high ranking among all Input pillars and an even higher ranking among all Output pillars, the strongest pillars being Market sophistication and scientific outputs, in addition to strong scores in institutions, human capital and research, infrastructure, business sophistication and creative outputs. However, it does have several weaknesses—such as a low number of graduates in engineering, a poor share of renewables in energy use, and a deficit on ecological footprint and biocapacity. Its strengths are its low rigidity of employment, high tertiary enrolment, a share of 2.8% of GDP spent on R&D, the good quality of its scientific research institutions, well developed government online services, and positive credit and investment environments. The USA is also very robust in new innovation metrics.

There is a point of view among some HRD scholars that USA does not have a clear, coordinated vision of its human resource development at a national level and is “behind most of the rest of the world in acknowledging the value of NHRD (Cho and McLean, 2004; p. 391).” This argument has been refuted by others who point out that the USA has a well-defined national HRD policy and implementation system, as well as a supportive legislative system (Wang, 2008). The American Competitiveness in the Twenty-first Century Act of 2000 (ACWIA, 2000), and the establishment of a national network of workforce investment boards (WIBs) are just some of the examples of initiatives which may be reasonably considered to be in the domain of NHRD,
suggesting that the country's national HRD policies possess attributes of excellent NHRD (Wang, 2008; Wang & Swanson, 2008).

Faced with the reality of increased global competitiveness, there is a growing emphasis to strengthen the competitive advantage of the nation, reflected in the President's message that to win the future, Americans need to out-innovate, out-educate, and out-build the rest of the world (Obama, 2011). The President's Council on Jobs and Competitiveness (Jobs Council) was created in January, 2011, to ensure that America has the talent in place to fill existing job openings as well as boost future job creation (Jobs Council, 2011). Partnering with private industry, steps have also been taken to double the engineering internships available to help address the engineering shortage and graduate 10,000 more engineering students from American colleges and universities each year. In another example of collaboration across sectors, President Obama launched the Advanced Manufacturing Partnership (AMP) in June 2011, a national effort bringing together industry, universities, and the federal government to invest in the emerging technologies, such as information technology, biotechnology, and nanotechnology, that will create high quality manufacturing jobs and enhance our global competitiveness (Press Release, 2011).

Kao (2009) after analyzing the innovation models of various countries concluded that the USA benefitted from its Systems Integration model, following a mix-and-match approach. The country is especially well-positioned to serve as a base for innovation systems integration. It has the cultural diversity, global reach, reputation for innovation, talent base, infrastructure, educational institutions, and scientific resources to transform the global innovation landscape. By increasing its efforts in areas such as green energy and health care, the United States could reposition itself as a global innovation leader. Silicon Valley, an area with a rich mix of skills, ethnicities, and resources, as well as abundant educational, institutional, and even familial connections, could serve as a model for a USA approach (Kao, 2009).

**Singapore**

Singapore is at 3rd position overall on the GII index. Singapore is strongest in its Input sub-index, topping the rankings in human capital and research and business sophistication, but ranks lower on scientific outputs and creative outputs, showing a weak performance in the output sub-index and innovation efficiency rankings (94th).

The city-state of Singapore has turned out to be a tiger in the Asian economy, proactively undertaking policy initiatives to leverage its human capital through talent development. It has developed end-to-end innovation systems combining funding bodies, research institutions, and structures for business and academic collaborations; all in support of a national HRD policy (Ashton, 2002). Compared to older industrial economies and western economies that let market forces control skill development, due to the high degree of autonomy wielded by the state, Singapore has been able to pursue long-term industrial strategies and implement educational and training systems to ensure the strategies were successful. The state's ability to influence demand for skills through the pursuit of an industrial policy; to control supply by a tight control of skills through the education and training system; and to coordinate demand and supply has contributed to the high rates of growth (Ashton, 2002). Having adopted an aggressive goal of transforming the country from an investment-driven system to an
innovation-driven economy, Singapore has put together a comprehensive mosaic-like integrated strategy, and is implementing workforce development efforts through government agencies such as the Standards, Productivity and Innovation Board, and the Workforce Development Agency (Alasoini, 2009). Singapore’s innovation model has been what Kao (2009) calls, a Focused Factory, where all its innovation investments are focused on a handful of industries or research fields. For example, Singapore’s focus on scientific research in the life sciences is demonstrated by the tax relief the government provides for companies conducting research in the area, the support in terms of training and funding, and the creation of the Biopolis, a 2 million square foot biomedical research center to provide state-of-the-art infrastructure. Materials science, clean technology, and digital media are other fields of focus for scientific research. In each of these areas, Singapore has been aggressive in scouting for talent globally by providing an inviting atmosphere conducive for creative thinking and in generously funding graduate students in life-sciences and inviting them to return to Singapore with their creative talent (Kao, 2009).

**Republic of Korea**

The Republic of Korea ranks 16th on the overall GII. It tops the regional rankings on the Output sub-Index, on which it ranks 11th worldwide. The Republic of Korea is among the most efficient innovators among high-income countries. The country has important strengths across the board. It ranks 1st on two sub-pillars, ICT and knowledge creation, and on five indicators - gross tertiary enrolment, the government’s online service index, e-participation, the depth of credit information, and resident patent applications at the national office. It is also ranked among the top 10 positions on three other sub-pillars: tertiary education, investment, and knowledge absorption (INSEAD, 2011).

The Republic of Korea is another tiger in the Asian economy that has developed a national HRD policy to leverage its human capital and has been able to do so effectively due to the high degree of autonomy wielded by the state (Ashton, 2002). It was Korea’s President Dae-Jung Kim who put Human Resource Development on the national agenda. Faced with a scarcity of natural resources, South Korea has intentionally tapped its national human resources. A NHRD policy has been pursued in order to accelerate its economic development, and strengthen its national competitiveness (Hawley & Paek, 2005). The Korean Research Institute of Vocational Education and Training defined NHRD as all efforts by society to have efficient development and utilization of national human resources required for increasing the quality of life and strengthening national competitiveness for a knowledge-based 21st century society (McLean, Bartlett, & Cho, 2003).

**China**

China tops the GII rankings among lower-middle income countries and is the only developing country to be among the top 30 (29th) in the overall GII rankings. China tops the rankings in the input sub-index within its income group, with high scores on Market and Business sophistication. It has the 5th most dynamic stock market in the world and among the top 20 on market capitalization, placing it within the top 10 on the Investment subpillar. China ranks first on the percentage of firms offering formal training and in the
top 5 on high-tech imports and within the top 10 on R&D financed and performed by businesses. Its weaknesses are on Institutions and Human capital and research. China scores well on the Output sub-index, with a 14th position overall, owing to its strength in resident utility model, patent, and trademark applications, growth in labor productivity, and impressive high-tech as well as creative goods exports.

In the last few decades, China has undergone significant social, economic, and political transition from a rural agricultural, socialist, self-contained community to an industrialist, market-driven, global society (Wang & Wang, 2006). The concept of HRD was introduced to China after Deng Xiaoping initiated the ‘reform and open-door policy’ in 1978 and announced that “modernization cannot be realized through unrealistic talk; it needs knowledge and human talent” (Yang, Zhang, & Zhang, 2004). The People’s Republic of China thus has become a field for conflict and confluence of three ideologies: Confucianism, socialism and capitalism; with Confucianism emphasizing social harmony, socialism emphasizing individual morality and loyalty to the party and its ideology, and capitalism emphasizing individual growth and organization performance (Yang, 2002). Socialist ideals dominate the HRD perspectives in China where individuals are considered the nuts and bolts of a big machine and a bureaucratic system assigns working roles through a top-down approach (Yang, Zhang, & Zhang, 2004). China has set a goal of transforming itself into an innovation-driven country by 2020. According to Kao (2009), China is using the brute force model working on the hypothesis that if a large number of people work on innovative ideas, at least some of them are bound to yield valuable results. For example, China has doubled the number of its institutions of higher education, just in the first half of this decade with an aim of producing a large number of specialists in every area of science and technology. China also has been successful in educating its citizens abroad and encouraging them to return to contribute to the Chinese economy. The Chinese Bureau of Statistics for 2005 cites a total number of 34,987 returning Chinese students compared to a 9,121 in 2000 (Dente, 2009). Highlighting the Chinese automobile industry as an example of the use of the brute force model, Kao (2009) points out that an estimated 50 car companies are vying for new business models and automobile designs, and while it is clear that some will fail, a few will rise above the rest and prove to be world-class.

China has also been leveraging national policy to influence knowledge flow. Chinese researchers in the USA are returning to labs in China to try their innovative ideas since the administrative process for grant applications is far less bureaucratic in China (Dente, 2009). In a survey of Chinese migrants, international migration researcher Saxenian found that 53% of Chinese hope to start a business back home (Davone, 2005). Beine, Docquier, and Rapoport (2008) reports that China is among the countries that has been making the most gains from the migration of their highly skilled workers.

India

India is a lower-middle-income country, the second most densely populated country in the world, and 11th in GDP (USD 1,310 billion), ranked 62nd on the GII, making it the first in the South Asian region. Its strengths are on the output sub-index with brilliant performance in computer and communications services exports, high labor
productivity growth and ranks high on knowledge diffusion indicators and creative outputs. India is also a regional leader on the Innovation Input sub-index. However, India is only 8th in comparison of GII among countries in its income group, with poor performance on the input side on business environment, elementary education, tertiary education, and knowledge workers. Its high marks on R&D, general infrastructure, and investment as a result of its deep and dynamic stock market, makes it a regional leader on the Innovation Input sub-index.

India has adopted the ‘Hollyworld’ model in urban centers like Bangalore to transform itself into an innovation epicenter, providing the culture of a cool community to attract creative talent (Kao, 2009). India has also been able to attract its stellar talent abroad to invest and contribute back in the home country to support its innovation and economic progress (Saxenian, 2005). In 2000, the Indian government set up a High Level Committee on the Indian Diaspora with a mandate to recommend policy options for strategies, programs and forms of organization. Specific policies that have contributed to India’s ability to attract its Diaspora back home include: A 500% increase in the budget for the Ministry of Overseas Indians, a provision for dual citizenship, a special ministry to recognize Persons of Indian Origin (PIO), and a Research Scientists Scheme which aims to bring back Indian nationals working overseas to teach in Indian Universities (Seguin et al., 2006). Beine, Docquier, and Rapoport (2008) report that India is among the countries that has been making the most gains from the migration of their highly skilled workers. Examples of the success of such policies can be seen in the successful creation of start-ups in Bangalore by Indians owning computer firms in California’s Silicon Valley (Barre et al. 2003) and in the involvement of the Indian American medical community in improving the quality of Indian hospitals through sabbatical residences (Davone, 2005). National policies on HRD, however, have been limited to education and culture, due to the challenges they face as a result of the multidimensionality of the country (Rao, 2004).

Brazil

Brazil is in the top 50, ranking 47th, on the overall GII. It tops the Output rankings among the middle-income countries, owing to its strengths on utility model and trademark applications by residents; growth rate of labor productivity; and exports, both in computer and communications services and in creative services. Brazil is weak on the Input side and its high ranking on GII among upper-middle income countries shows a capacity to achieve more innovation outputs from less favorable conditions, ranking 7 on the Global Efficiency Index (INSEAD, 2011).

For a nation with deep inequalities, this progress was not achieved overnight. The Education Ministry of Brazil created the Professional Education Expansion Program in 1997 to reform technical education particularly in the telecommunications and petroleum industries. The Brazilian government continues to drive workforce development through the National Services of Industrial (SENAI) and Commercial (SENAC) Learning. SENAI focuses on technical education in the industrial sector and SENAC focuses on service companies in information-intensive segments. The government has recognized the influential role of multinational companies in the training and development of its citizens and is actively engaging them in identifying needs and developing employee skills (Hasler, Thompson & Schuler, 2006). Trade unions play a
prominent role in training and development in areas outside the scope of an organizational setting and political organizations address the training needs of community and ethnic contexts. Thus the collaboration between government, private sector, and NGOs is preparing the talent in Brazil to challenge its obstacles be a formidable player in the global market. Beine, Docquier, and Rapoport (2008) report that Brazil is among the countries that has been making the most gains from the migration of their highly skilled workers.

**Implications for Human Resource Development at the Societal Level**

National Human Resource Development in the global economy requires HRD professionals to be knowledgeable about the web of interaction between the different institutions in public and private sectors and skilled in working with key players in implementing strategies in a manner that the strength of the different institutions is leveraged. This requires a broad, global understanding of the context within which policies have to be framed, as well as the competitive strategies of other nations. It also requires a deep understanding of the complex relationships between government, businesses, universities, research institutions, and other players in the national arena. Thus, researchers are called to explore these issues and inform the profession. In addition NHRD professionals should have the market savvy to understand trade and investment issues. It is also critical for them to understand the complexities and nuances of attracting, employing and retaining knowledge workers including innovation linkages on one hand and the management of knowledge creation, knowledge diffusion and knowledge impact on the other. Last, but not the least, they must have the ability to value and manage creative outputs. Academic programs should expand their curriculum to include topics related to this issues that will prepare NHRD professionals for their practice at the societal level in the global context.

**References**


