Malaysia Transitions Toward a Knowledge-Based Economy

By Ramlee Mustapha and Abu Abdullah

The emergence of a knowledge-based economy (k-economy) has spawned a "new" notion of workplace literacy, changing the relationship between employers and employees. The traditional covenant where employees expect a stable or lifelong employment will no longer apply. The retention of employees will most probably be based on their skills and knowledge that can create advantages for the company over its competitors. Employers invest in the skills of their employees to improve productivity and the profitability of the company. Training costs can be substantially higher than that of general or academic education but are justified when the value of the company's earnings and productivity exceed the cost of the training. Numerous empirical studies regarding entry-level employee competencies from the perspective of employers have been conducted in both industrialized and developing nations. The results of the studies found that employers prefer certain types of entry-level competencies of the prospective employees. This article provides an overview of workplace literacy from the perspective of the employers and also reviews pertinent literature regarding Malaysia's transition toward a k-economy.

K-Economy

In the information age, knowledge is power. The k-economy is based on a paradigm that focuses on intellectual capital as a prime mover. With knowledge replacing physical and natural resources as the key ingredient in economic development, education and human resource development (HRD) policies require rethinking. While there is no standard definition of a k-economy, the UK Department of Trade

and Industry defined it as a knowledge-driven economy in which the generation and exploitation of knowledge play the predominant role in the creation of wealth (Economic Research Services Department, 2000). Meanwhile, the Organization for Economic Cooperation and Development (OECD, 1996) defined a k-economy as an economy that is directly based on the production, distribution, and use of knowledge and information.

Investment in human capital is critical in a k-economy. Human capital theory views education and training as an investment that can yield social and private returns through increased knowledge and skills for economic development and social progress (Schultz, 1963). The economic argument in favor of knowledge-based education and training is linked to the perceived need of the global economy. It is based on the assumption that economic growth and development are knowledge driven and human capital dependent.

Despite a growing emphasis on knowledge-based education and training, minimal research exists with respect to the new workplace literacy especially from the employers' perspective. Therefore, this article attempts to provide an overview of workplace literacy from the perspective of the employers and also reviews pertinent literature regarding Malaysia's transition toward a k-economy.

Workplace Literacy: Employers' Perspective

Murphy and Jenks (1983) conducted interviews to identify the traits of successful entry-level professional employment applicants. The job opportunities investigated were either management trainee, junior-level professional, or apprenticeship positions. Employers clearly indicated that both functional and adaptive skills were needed. There was also a clear preference for certain types of skills. Nearly 40% of the responses related to communication and persuasion skills. Adaptive skills identified by the employers included a wide range of attitudes, personality traits, and work habits. Competition is a major factor that motivates industry to be more efficient and to employ strategies that will improve production, service, and product quality. Because such strategies usually require workers' collaboration and teamwork, employers need creative, flexible workers who have a broad range of interpersonal and managerial skills.

Junge, Daniels, and Karmos (1984) surveyed 116 large U.S. companies to rate the knowledge and skills of employees related to mathematics, writing, reading, speaking, listening, reasoning, and science. The purpose of the survey was to determine the perceptions of employers regarding the workplace literacy that is important for successful employment. They found that speaking, listening, and writing followed by reasoning and reading skills were regarded as important requirements for successful employment. The most frequently cited qualities were good attitude toward work; willingness to adapt and learn; getting along with others; neat and appropriate appearance; promptness; infrequent absence from work; familiarity with basic computer knowledge; and good oral, written, and listening skills.

Research has also revealed reasons for rejection of job applicants and termination of employees. In a survey of employers conducted by the Advisory Council for Technical and Vocational Education in Texas, the reasons provided by employers for rejecting job applicants included little interest for wanting the job, past history of job hopping, poor communication skills, health problems, immaturity, personal appearance, poor mannerisms, personality, lack of job-related skills, and poorly completed application forms (Brown, 1976).

Zakaria (1988) studied the perceptions of Malaysian employers regarding essential employee traits and employability skills. Employers rated arrive on time, demonstrate a sense of responsibility, cooperate with the supervisor, and possess a positive attitude toward work as the major desirable employee traits.

In 1989, Lieberman Research Incorporated conducted a study of 1,000 senior executives of FORTUNE 500 companies to explore the beliefs of the executives regarding the American public education system (Lieberman Research

Inc., 1989; Passmore, 1994). Most of the responding employers were highly critical of the public education system. Approximately two thirds of the respondents asserted that their companies had difficulties hiring employees because of basic skill deficiencies of job applicants and that identifying potential employees with adequate basic skills was becoming more difficult. Clearly, employers preferred employees who were motivated, possessed basic skills, and had satisfied a higher performance standard.

The Employment and Training Administration of the U.S. Department of Labor and the American Society for Training and Development (ASTD) conducted a survey of employers seeking potential employees (Passmore, 1994). They found that many employers valued basic literacy—reading, writing, and computing. In addition, the employers preferred employees who had motivation to learn; could communicate, especially through listening and oral communication; could adapt through creative thinking and problem-solving skills; possessed effective personal management skills; had interpersonal, negotiating, and teamwork skills that made them effective workgroup members; and could influence others to act through leadership skills. Moreover, employers preferred to conduct their own technical skills training but only with employees who possessed basic skills (Carnevale, Gainer, & Meltzer, 1990).

The Harris Education Research Center (HERC, 1991) assessed the views of employers, educators, parents, and students regarding American education. Employers clearly indicated that their new employees were borderline in terms of functional literacy, capacity to express themselves, and basic functional skills. In contrast, students and parents thought that their schools were doing well (Passmore, 1994).

The U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) examined the literacy required to enter employment using interviews with business owners, public employers, union officials, and line workers. The SCANS report identified five major competencies and three foundation areas that were required for entry-level job performance. Basic skills, thinking skills, and personal qualities formed the foundation on which the five broad competencies were constructed. Basic skills included reading, writing, arithmetic, mathematics, speaking, and listening. Thinking skills included creative thinking, decision making, problem solving, abstract visualizing of problems, knowing how to learn, and reasoning. Desirable personal qualities included individual responsibility, self-esteem, sociability, self-management, and integrity.

Distler (1993) studied attitudes and perceptions of Maryland's employers toward vocational education and employment training programs. The majority of the employers indicated that the present educational approach is not sufficient to train students effectively for the changing demands of the workplace. If vocational and training programs are to be effective, cooperation among educators, legislators, employers, and the community must be established.

An investigation by Custer and Claiborne (1995) supported previous research in which employers placed more emphasis on employability skills rather than on technical skills. They surveyed 299 U.S. employers in the health, trade, and industry occupational areas. The purpose was to explore employers' priorities regarding the types of skills they perceived to be critical to their needs and the workforce. The findings revealed that the most important skills cluster was employability skills. Basic skills ranked second and technical skills third.

A recent empirical research on the perceptions of Malaysian employers regarding employability and workplace literacy was conducted by Mustapha (1999). The purpose of the study was to examine employers' perceptions regarding the critical workplace literacy and employability skills of vocational graduates. The sample consisted of 120 employers from large and medium-sized manufacturing companies. The study found that employers believed that the completers of vocational and technical programs had better employment opportunities than completers of academic programs. Further, employers indicated that vocational and technical graduates possessed necessary technical

skills. However, employers were less satisfied regarding the graduates' motivation, communication, interpersonal, critical thinking, problem solving, and entrepreneurial skills. This clearly suggests that affective and employability skills should be integrated into vocational and technical programs. Technical competencies were perceived by Malaysian employers as the most important knowledge and skills that vocational and technical graduates should possess. They also believed that communication and interpersonal skills are important. These results seem to support previous research regarding the importance of employability skills (Custer & Claiborne, 1995; Greenan, Wu, Mustapha, & Ncube, 1998; HERC, 1991; Lieberman Research Inc., 1989).

Malaysia Transitions Toward Knowledge-Based Economy

The shift to the k-economy is part of a wider plan to achieve the objective of the nation's Vision 2020. Vision 2020 is a 30-year plan to "push" Malaysia to achieve a level at par with industrial nations in terms of economic performance and technological capability (Mustapha & Abdullah, 2000). With the move toward a k-economy, the country can achieve sustainable Gross Domestic Product (GDP) growth rates in the long run with knowledge playing a dominant role in driving productivity and sustaining economic growth. It is projected that through an information and knowledge-based economy, the level of the country's GDP can increase four fold within 20 to 25 years (Economic Research Services Department, 2000).

However, Malaysia currently lacks some of the critical elements to support the k-economy. Among them are the lack of adequate knowledge and skilled human resources, inadequacy of a k-economy supportive education and training infrastructure, a lack of R&D capability, a relatively weak science and technology base, a deficiency in institutional support and infostructure, a slowly evolving financing system, and a lack of technopreneurs (Govindan, 2000).

The new global market calls for visionary leadership and the adoption and application of new management and organizational principles. The old command-and-control management system that many Malaysian organizations are used to may not work in a new competitive environment. The education, training, and employment policies have to change. Employers need to recruit "knowledge" workers for higher skills jobs. This requires our education system to produce graduates with relevant knowledge, critical and higher order skills, and proper attitudes.

IT Infrastructure

Tangible evidence of Malaysia's commitment to the k-economy is the Multimedia Super Corridor (MSC). This 50 x 15 km wide corridor stretches from the center of Kuala Lumpur to Cyberjaya, a newly established city approximately 40 km south of Kuala Lumpur, and is designed to incubate high technology companies. When the MSC was first announced in 1995, it was estimated that the government would spend RM 28 billion (approximately USD 7.4 billion) to develop the infrastructure and facilities required to attract international high technology companies (Mohamed, Hasan, Dzakiria, & Kassim, 1999).

It aims at revolutionizing IT and multimedia industries by creating a massive corridor with a conducive environment for local and international companies wanting to create, distribute, and employ IT and multimedia products and services (Abdul Manab & Othman, 1999). MSC is also expected to place Malaysia as a regional and international technology and telecommunication hub. The MSC will propel the transfer of technology and become the test bed for R&D in high-tech industries (Mohamed et al., 1999).

Due to the increasing demand for knowledge workers to work in the IT and high-tech industries of the MSC, the Smart School program was adopted as one of the seven flagship applications. The flagship will support the government's plan to obtain the status of an industrialized nation by the year 2020 and to gain a competitive edge over other developing countries in the global economy (Mohamed et al., 1999). In the Smart School concept, learning will be self-directed, individually paced, contextualized, and reflective using IT as a prime enabler (Abdul Manab & Othman, 1999).

It is hoped that, eventually, all schools in this country will be smart schools.

Despite the MSC project, schools in Malaysia continue to lag behind other sectors such as business and entertainment in utilizing IT and multimedia technologies. A majority of schools still do not have enough computers and Internet facilities for most students to use frequently. However, during the last decade the increase in IT access and the emergence of new telecommunication technologies have somewhat changed how teachers perceive technology and its applications in teaching and learning.

The IT literacy among Malaysian students has not yet reached its satisfactory level. To reach its maximum potential requires full commitment, serious thinking, research, and experimentation. Although Malaysia has made great strides in enhancing its IT infrastructure, IT utilization and structure in educational institutions are still inadequate. Teachers and administrators should reevaluate and restructure the curriculum so that the curriculum is viable for IT literacy to be developed among students (Mohamed et al., 1999). Therefore, the administrators and educators should be urged to plan the curriculum carefully and systematically in meeting the needs of the society as a whole.

Policy Implications on New Workplace Literacy

Highest Level Commitment

The Malaysian government has already recognized the importance of adapting to this new economy and is committed to transform the economy from a production-based to a knowledge-driven economy. The prime minister during his official speech at the launching of the information technology campaign in 1997 stated that IT is at the forefront of the country's national socioeconomic planning and development. The government formulated the National Information Technology Agenda (NITA) in 1996 to provide the country with the direction and the way forward with IT. The NITA has spelled out a three-pronged strategy aimed at developing a knowledge society through building and developing the appropriate IT structure, the creation and development of IT-based applications, and human development effort. In order to achieve this, the balanced development of three important, interrelated elements that involve people, infostructure, and applications are stressed (Economic Research Services Department, 2000).

K-Economy Master Plan

The Malaysian K-Economy Master Plan outlines the major k-economy policy initiatives. Planned reforms in the education sector include further privatization, twinning arrangements with foreign institutions, and the construction of advanced technical institutes and community colleges. Infrastructure will be developed that allows for the use of electronic diagnostic tools in hospitals and networking among government departments, their suppliers, and their customers. Increased bandwidth is planned to facilitate greater e-commerce capacity. A draft of amendments to various financial regulations aims to create a more favorable investment climate for local and foreign firms, particularly those in designated high technology sectors. It also includes profit repatriation and taxation arrangements designed to lure foreign investors back. This is in addition to a very publicized crackdown on software piracy. Overall, the initiatives aim to address the serious shortages of knowledge and skilled workers in Malaysia and to attract much-needed foreign investment and expertise, particularly in alliances with local firms and institutions.

IT Literate Society

Reflected in a particular k-economy initiative, the "One Home-One PC" policy allows workers to withdraw their contributions to the Employees Provident Fund (a retirement fund) to purchase a personal computer. This initiative supports a long-term plan to link 25% of the population to the Internet by 2005. Another initiative is the "Internet Desa" (Internet for rural areas) program, which aims to provide Internet access and basic computer skills to people in rural areas via a networked personal computer located in their local post office.

National Information Technology Council

The National Information Technology Council (NITC) was established in 1994 to guide the country toward the knowledge empowerment of Vision 2020. The NITC aims

to enhance the development and utilization of IT as a strategic technology for national development. The NITC acts as a think-tank at the highest level and advises the government on matters pertaining to the development of IT in Malaysia (Infosoc Malaysia, 2000). The government's commitment toward the creation of a k-economy is also evidenced by the development of the Multimedia Super Corridor, the idea mooted in 1994, and the creation of a pioneer legal and regulatory framework encompassing, inter alia, the Communication and Multimedia Act, the Computer Crimes Act, and the Digital Signatures Act (Economic Research Services Department, 2000).

Development of Knowledge Workers

The creation of quality human resources is important in a k-economy. These individuals will form the backbone of the k-economy. Knowledge workers are versatile, autonomous, and highly skilled and are able to leverage and build knowledge to produce useful action with very strong and analytical skills. They are flexible and have a high tolerance for ambiguity. For Malaysia to produce a pool of k-leaders and k-workers, the educational system needs to be revamped and restructured. The focus should be directed to making the existing curriculum more innovative to help students to invent and develop a critical and analytical mode of thinking and ultimately create a sufficient pool of well-educated, highly skilled and strongly motivated workers (Economic Research Services Department, 2000).

The use of IT in teaching and learning should facilitate knowledge construction and engage learners in constructive, higher order, creative, and critical thinking (Jonassen, 1996). It should also develop team-based collaboration and communication skills for solving real-life problems. Teachers must redesign their instructional material to include the use of IT as a cognitive tool rather than a mere delivery medium.

In this area, the government has already taken the initiative of introducing the Smart School project, which was launched during the review of the Seventh Malaysia Plan (1996-2000). The objective of the project is to produce a new generation of IT-literate Malaysians who are creative and innovative, adept with new technologies, and able to access and manage information to enhance the competitiveness and productivity of the economy. At the same time, the government is campaigning hard to woo back Malaysians who are now working overseas. In March 2000, the prime minister announced a campaign to attract 5,000 skilled foreign workers a year to help the nation into the information age to ensure a massive brain gain, an infusion of men and women of extraordinary talent, creativity, knowledge, skill, and other capabilities (Economic Research Services Department, 2000).

To advance Malaysia into the forefront of knowledge, investment in human capital is critical, as a k-economy demands creative, innovative, and knowledgable human resources. It is for this reason that the state has continued to allocate a substantial portion of the national budget for financing the expansion and upgrading of education and training facilities. However, human resource development needs to be further intensified, particularly through public-private sector collaboration in building science and technology human resources as well as the intellectual capability and competency in management and entrepreneurship. In this regard, opportunities for lifelong learning for all levels of the workforce should be enhanced through this collaboration.

Rigorous Research and Development

The structure of the economy becomes less distinct in the k-economy. Nevertheless, the manufacturing sector, which accounts for more than one third of the GDP of the country, still continues to assume an important role in the k-economy. However, in view of the migration of the economy from production based to knowledge based, the manufacturing sector would have to gear up to adjust to the rapid change in technological advancement by improving its products through R&D and enhancing the pool of "knowledge" workers (Economic Research Services Department, 2000).

In a k-economy, it is crucial to develop the R&D and the services sectors. It is generally known that the level of development of the services sector, particularly the knowledge

Table 1. Knowledge-Workforce Among Selected Countries

Selected R&D Statistics (1997)			
Countries	K-Skills Workforce (as % of total workforce)	R&D/ GDP (%)	K-Skills in R&D (per million population)
Malaysia	10.7	0.3	87
Singapore	26.4	1.4	2,512
Korea	15.1	2.8	2,636
Taiwan	15.5	1.9	3,340
Japan	22.9	2.8	5,677

Note. Data source: Bank Negara Malaysia, 2000.

intensive segments of it, has become a key determinant of the national competitiveness. There are many compelling reasons for Malaysia to develop its services sector. To begin with, expanding this sector helps create national wealth: A positive correlation exists between high GDP per capita and the intensity of services activity in the economy, mostly because compensation levels in this sector normally surpass those in agriculture and manufacturing (Economic Research Services Department, 2000). Moreover, in economies with a strong emphasis on services, people tend to climb the "value-chain ladder" much more rapidly. It is generally believed that in the k-economy, the information-related industries and knowledge-intensive industries play the dominant role.

Innovation is one of the key success factors in a k-economy, and it is R&D that determines innovation. According to the OECD (1996), the proxies generally used to represent the production of new ideas and innovation is R&D expenditure and the number of patents. Based on some available relevant statistics (see Table 1), it is apparent that Malaysia currently has a relatively low k-workforce and R&D investment.

Creativity, Innovation, and Entrepreneurship

IT leaders and business gurus believe that the new economy is about the power of ideas and knowledge, which is why it is important to encourage entrepreneurship in Malaysia. Entrepreneurship is a collaborative effort. It may be easy to generate ideas, but hard to provide a conducive environment to allow the ideas to kick-start and grow. School systems at all levels should include entrepreneurship in their curriculum. It should focus on creating new and innovative ideas by the students and converting them into full-fledged business plans for future use.

Infrastructure, Accessibility, and Connectivity

There must be affordable and equitable access and connectivity to ensure that all levels of society can participate in the new economy. Businesses and citizens must have access to a low-cost, high-speed communication infrastructure. This is key to balanced urban and regional development across the country. Reducing access costs plays a major role in this context. In terms of accessibility to the IT infrastructure, Malaysia performed better compared to other developing countries, but the situation reversed when compared with advanced countries. Table 2 shows the number of personal computers and Internet hosts in Malaysia vis-à-vis other countries.

Table 2. Indicators of Communication and Information Infrastructure Among Selected Countries

Indicators of Communication and Information Infrastructure in 1996		
Countries	No. of Personal Computers (per 1,000 population)	No. of Internet Hosts (per 1,000 population)
Malaysia	43	19
United States	362	442
United Kingdom	193	149
Japan	128	76
South Korea	132	29
Singapore	217	196

Note. Data source: Jaafar, 2000.

Lifelong Learning

With knowledge replacing physical and natural resources as the key ingredient in economic development, education and HRD policies must be given due priority. The approach to HRD must be balanced and holistic. There must be a genuine partnership among government ministries, especially the Human Resource and Education Ministries, and between the private and public sectors to strategize and implement a human resource policy that is directed towards fulfilling the objectives of a k-economy (Badawi, 2000). Because economic development is now more dynamic than ever due to rapid technological improvements and global competition, the skills needed to succeed in this new economy will be different. Few will be able to equip themselves with lifetime working skills just from their years of formal education.

Lifelong learning conducted through non-formal channels such as virtual universities and distance learning, with skill acquisition at all age levels, must be promoted if the human resource is to constantly stay abreast of new and rapid development in the k-economy. In the context of HRD, Malaysia needs to adopt a two-pronged strategy (Badawi, 2000). One is to ensure that those who are currently unskilled or low skilled are given the opportunity to learn and train so that they can have a productive role in the k-economy. And second, incentives and opportunities must be given to those with the potential to keep on acquiring knowledge and skills. HRD must move every Malaysian up the skill ladder, and at the same time reward excellence by allowing all individuals to fulfill their potential. If the school and training systems fail to train and retrain the traditional workers, their existing skills may become obsolete in the new economic environment. If those with minimal education, knowledge, or skills are not given the opportunity to continue their education, they will lag behind and will be less likely to participate in the k-economy. Indirectly, the government will lose precious human capital that could have been harnessed effectively into a new economic paradigm. Therefore, HRD must be geared toward providing every citizen an opportunity to contribute at his or her optimum level.

It is evident that the Malaysian government is committed to building a critical mass of "knowledge" workers. Already under consideration are plans to build more advanced technical-

industrial training institutes and community colleges in addition to the establishment of more "second route" programs to provide school leavers the opportunity to learn new skills. There is also a need for greater alliances between universities and the private sector to encourage industrial placements and internships. Greater attention must also be given to training workers in the small and medium industries (SMI). Most of the SMI firms can't afford to invest in training, retraining, and R&D.

Therefore, public sector HRD initiatives must prioritize SMI workers who have minimal opportunities to enhance their skills by their employers. At the same time IT training must be promoted, especially among working adults, to increase IT literacy among the workforce. School teachers should be given incentives to continue to upgrade their IT skills in light of the primacy of these tools in the k-economy. Civil servants and servicemen should also be given this training so that they are able to be absorbed into the technology intensive private sector upon the completion of their service. ICT training should also be extended to nonworking adults such as the disabled, senior citizens, and housewives so that they can contribute to the k-economy as virtual home-based workers, offering services through virtual interfaces such as the Internet.

In recognizing that HRD is a critical factor in a k-economy, smart partnerships between the public and private sectors should be established. In particular, the private sector must play a greater role in technical and vocational training in order to complement the efforts of the government. The government should continue to assist the private sector in training and retraining workers, but there must be a continued commitment from employers to encourage and provide incentives for their workers to acquire new knowledge and skills.

What It All Means

Research has shown that employers perceive technical competency as the critical workforce literacy. Communication and interpersonal skills are also essential. Other skills include critical- and problem-solving skills, self-motivation, and management skills.

However, to compete and survive in the era of a k-economy and globalization, a new set of workplace literacy is deemed necessary. The k-economy requires knowledgeable, skilled, dynamic, creative, and innovative human resources. In addition, the new global market calls for visionary leadership and the adoption and application of new management and organizational principles. The old command-and-control management system that many Malaysian organizations are used to may not work in a new competitive environment. Thus, education, training, and employment policies have to change. Employers need to recruit more "knowledge" workers for higher skills jobs. This requires the education system to produce graduates with relevant knowledge, critical skills, and proper attitudes. Teacher training programs must also undergo substantial transformation. To create a new kind of workplace literacy based on the k-economy, some of the recommendations include:

- Create a technology roadmap to search for "niche" technology for Malaysia.
- Identify future knowledge and competencies.
- Invest in human capital.
- Provide a world-class telecommunication system that is accessible to all at competitive prices.
- Create an information society for all, where every citizen can play an active role in the k-economy.
- Promote the use of information technologies in all sectors.
- Equip all schools with high-speed Internet connections and multimedia PCs in sufficient numbers.
- Adapt the school curriculum and train the teachers in IT.
- Provide opportunities for lifelong learning.
- Invest in extensive research and development in order to increase the country's competitiveness both regionally and internationally.
- Establish systematic R&D networks linking businesses, educational institutions, and research institutes.
- Recognize and reward individuals or industries that are involved in creative

and innovative work practices.
- Promote smart partnerships between the public and private sectors.

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