Knowledge Economy and General Education

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Abstract

This article examines the general education system from the knowledge economy perspectives. The primary and secondary education has the widest spread in Sri Lanka as over 97% of the school-aged children enter primary school and 89% continues on to grade six or the junior secondary level. About 82% completes the compulsory education of nine years and even sit for the General Certificate of Education examination. Therefore, orientation of primary and secondary education system along the pillars of knowledge economy is necessary. The article examines these key constructs and reforms that would be required to produce a new generation of primary and secondary school graduates to be effective, efficient and productive citizens.

Preamble

Education has always played a transformative role in the development. Education in almost all countries has a delayed impact on development because to educate a child at different levels, each cycle takes a few years. The usual primary cycle is 5 - 6 years, the Junior Secondary is 8 – 9 years of schooling, Senior Secondary takes 10 – 13 years, and higher education takes 16 – 17 years of schooling. The impact of education on economy comes only when the children in school join the workforce. This again takes a few more years to happen. The general comment about education is that there is a mismatch between skills taught in schools and universities with workplace needs (Twigg 2002[2]; Sedere 2000[3]; Kozma, 2005[4]). The lack of relevance of education to the world of work, or the "*external efficiency of the education*', is one of the issues to be addressed. Until 1960s, the external efficiency was not a serious issue in Sri Lanka because only a few continued schooling and those completed secondary education always had full employment. With the spread of formal education to the common man's sons and daughters, the slow-growing economies could not absorb the numbers graduating and seeking employment at different levels of the education. Though education was adding value to economies, the marginal returns of education was diminishing. This led to either accumulation of the unemployed or the number in under-employment. This situation was more critical in the developing countries where formal education is more general and academic and less market oriented. The lack of external efficiency and lack of relevance of formal education in today's context is a shortcoming of the system of education.

Education and human resource development has a major contribution in the socio economic transformation. Education is undoubtedly one of the most powerful tools of socio economic change and sustainable economic transformation. Even a small change in growth can make a huge difference in the economy. A 3% annual growth rate in Gross Domestic Product (GDP) doubles the size of an economy in 23 years, compared to 35 years needed to double an economy with a 2% growth rate. With a 5% growth rate, it takes only 14 years. Creating the conditions that foster economic growth is a significant challenge for policymakers. But even more important is how to sustain growth over an extended period of time and assure that its benefits are distributed equitably (Kozma[5], 2005). The interdependence of education and training with the economic transformation is evident at macro- and micro-economic activities (World Bank, 2002[6]).

The ability to produce and use knowledge has become a major factor in development. In fact, this ability is critical to a nation's comparative advantage. Increasing demand for secondary education in many parts of the world is an invaluable opportunity to prepare a well-trained workforce for a knowledge-driven economy.

Global economic and social trends over the past several decades have profound implications for educational reforms and the use of technology in schools. The convergence of these trends has created significant economic and social opportunities and *enormous* challenges. The pervasiveness of information and communication technologies (ICT)-from cell phones, to low-cost video cameras, personal digital assistants, and laptops wirelessly connected to the Internet-has changed the way people live, work and play. New knowledge and the use of new technologies have resulted in the creation of new products, services, and jobs, some of which were unimaginable only a few decades ago. At the same time, trade agreements and the reduced costs of communication and transportation have increased the flow of capital, goods, services, knowledge and jobs between countries. The result has been significant worldwide economic growth with considerable social turmoil and dislocation (Kozma, 2005).

These converging trends have put tremendous stress on educational

and other social systems responsible for preparing society for the future and moderating the adverse impact of social and economic change. In the face of these trends, countries are confronted with the need to rethink their educational systems to prepare students for the global economy, to maintain economic progress, and to assure that their citizens will benefit equitably from this growth. To participate in this economy and to improve their standard of living, students need to leave school with a deeper understanding of school subjects, particularly science, mathematics, and technology, and with the skills needed to respond to an unbounded but uncertain 21st century–skills to use their knowledge to think critically, to collaborate, to communicate, to solve problems, to create, and to continue to learn. The goal of Kozma's analysis of the relationships between ICT education and socioeconomic development illustrates how best technology and education reform can contribute to equitable economic growth in the countries where economic disparities are alarmingly increased (Kozma, 2005).. The new economy requires a workforce capable of handling and exploding knowledge base and industries are looking to educational institutions to provide the necessary education and training (Twigg, 2002)[7].

This topic is addressed under three major sub-headings —

i. The knowledge economy
ii. Role of education in the knowledge economy, and
iii. Education in Sri Lanka and the knowledge economy.

The Knowledge Economy

The Evolution of Economic Perspectives

Knowledge economies are the economies which are directly based on the production, distribution and use of knowledge and information (OECD, 1996). Growth in economic output can occur with an increase in input factors: more equipment is purchased and more workers enter the labour force, what economists call capital accumulation. Increased productivity is the key to raising the standard of living and to sustained growth. Economic theory describes three factors that can lead to increased productivity: capital deepening (that is, equipment that is more productive than earlier versions), higher quality labour (that is, a more knowledgeable workforce that is more productive), and technological innovation - the creation, distribution, and use of new knowledge (Kozma 2005).

'Human Capital' rather than 'Knowledge' is one of the bases of knowledge economy. These two variables can be significantly different with respect to both rivalry and excludability. It may nevertheless be useful here to note some of Lucas's remarks relating to cardinality and measurability. 'By an individual's "human capital" means simply his general skill level, so that a worker with human capital is productive equivalent of two workers or a half-time worker with. What, one may wonder, is the cardinal measure of 'general skill level' that renders possible Lucas's statements about productive equivalence? His formal analysis certainly depends on the existence of such a measure. 'Knowledge' either is or can be rendered homogeneous or as heterogeneous. The question arises whether there exists any cardinal measure of the single stock of knowledge. It is certainly common to treat the 'stock of knowledge' as if it were a single magnitude with a cardinal measure, without any justification being given for this highly dubious assumption. In realistic terms, there are different entry levels for different types of human capital and treating human capital as homogeneous is less realistic. However, it makes a lost of sense to equate labour (human capital) from lowest levels to higher levels on productivity basis. The Sri Lankan general education model is a homogeneous model producing the same type of graduates at secondary level and its contribution to economy is rather questionable.

Theories of Endogenous Growth-(Knowledge Economy)

New theories of economic growth developed by Paul Romer (1986, 1987, 1990)[8] and others have led economists to question whether the neoclassical model is the most appropriate model of long-run economic growth. These thoughts are the most recent on knowledge economy. The new theories, collectively known as endogenous growth models, try to explain the fundamental forces that drive long-run growth rather than rely on factors determined outside the theory, as the neoclassical theory does.[9] Paul Romer (2009)[10]bases his theory of long-term economic growth on the accumulation of knowledge. He explicitly recognises knowledge as a factor of production, including it with the usual inputs-labour and capital.

The endogenous growth cites three limitations of the neoclassical. First, it relies on technological change to supply growth in per capita output instead of explaining the sources of technological change. Second, the neoclassical model provides only a rudimentary framework for analysing the effects of government policy on long-term growth. Third, the model has limited tools for analysing international trade and its link with economic growth. In particular, empirical evidence suggests that countries with an outward orientation seem to grow faster than those that are more protectionists. The neoclassical model, however, cannot address the question of whether openness to trade causes faster growth.

Economists have recently developed theories that address the shortcomings of the neoclassical model. Endogenous growth theory assumes that technological change occurs from within hence, it is an endogenous growth model. Paul

Romer, examines the idea of accumulation of knowledge - A spillover, an action taken by one person or firm that affects another person or firm, initiate on endogenous growth. Romer refined his model to explain why companies invest in research and development (R&D) when they know that any ideas that result will eventually benefit their competitors. He found that as long as society does not reach some type of technological limit, continuous innovation can allow per capita output to grow forever. Romer's model fills an important gap in the neoclassical theory by providing a rigorous description of the source of technological progress. In the recent years Romer and Jones (2009) explain six facts of the growth mode as increases in the extent of the market, accelerating growth, variation in modern growth rates, large income and TFP differences, rising human capital and long-run stability of relative wages. Many of these six facts do have a bearing on education and it is important for the education sector policymakers to understand these.

Role of Education in a Knowledge Economy

Implication of Endogenous Growth Theory (Knowledge Economics) on Education

Following Romer, other economists have developed models that expand the idea of endogenous growth. Although they use different variables and functions, one area that looks particularly has a bearing on education is human capital and training. Many endogenous growth models point to innovation as the key driver of long-run growth, and to a highly educated labour force as the key input to Research and Development (R&D). Although there are different views about the model and subsidising training or education by governments, Romer demonstrates that the government should avoid discouraging investments in human capital. The R&D sector, where a larger stock of knowledge raises the productivity of researchers engaged in R&D, and in the final output sector, where production benefits from a wider range of capital goods. Romer's later model displays constant returns to the accumulation of knowledge-the return on investment in R&D does not fall as the stock of knowledge increases. The resulting equilibrium features endogenous growth in per capita output, driven by the continuous introduction of new products and advances in technology. Lower interest rates increase the amount of human capital devoted to R&D by raising the discounted value of any given stream of future revenues associated with a new design. More research translates into a permanent increase in the economy's rate of growth. This indicates that subsidies for educating and training workers (the most important factor in developing technical knowledge) would be the next best policy.

Robert Lucas (1988)[11] outlines two models: Lucas's first model involves spillovers from the investment people make in formal education and the other features productivity growth driven by on-the-job training (learning by doing). Lucas notes that this model is consistent with international evidence on migration. If human capital has external effects, then workers in countries with high levels of human capital will be more productive and earn higher wages than those in countries with low levels. Workers in poorer countries, who will have lower levels of human and physical capital, thus have an incentive to migrate to richer countries. Since countries with larger stocks of human capital can remain permanently richer, there is no force for convergence in Lucas's model, and the incentive to migrate can persist definitely. Sri Lanka has an important case to address here because Sri Lanka very much depends on overseas employment and the educated labour force has enabled Sri Lanka to have a growing economy through migrant labour.

Lucas's second model starts from the premise that workers accumulate human capital through on-the-job training rather than through investments in formal education. In this model, workers accumulate human capital not by withdrawing from the labour force to go to school but by acquiring new skills as they learn to produce an ever-growing range of goods. This has a major bearing on Sri Lankan universities and technical colleges as most of the universities in Sri Lanka are still on pure academic learning model.

Trade should spur growth by providing researchers with greater incentives to provide new designs: R&D is another domain that Sri Lanka needs to concentrate on its journey to Knowledge-based Education. Though there are R&D Units in many government institutions, in most of these institutions in Sri Lanka are not geared to deepening of human capital. This also hints at institutional transformation. Most of the institutions do not provide sufficient financial support to R&D and pays a lip service with out serious commitment. All educational institutions, starting from the schools, through the universities need to transform to accommodate to become learning organisations to facilitate the deepening of human capital and prepare a human resource base that takes decisions based on knowledge than opinions. All government institutions are mostly administered on opinions and follows a 'transactional management culture (resolving day-to-day problems on opinions), than on a transformational management geared to transform institutions to facilitate the knowledge economy.

General Education in Sri Lanka and the Knowledge Economy

Sri Lanka as well as most of the developing countries is making efforts for educational reforms. However, education systems in Sri Lanka as well as in South Asia are heavily examination-oriented and

dominated by general academic education. Education and training systems need to respond to the sweeping changes brought about by globalisation and the knowledge economy can have far-reaching implications for developing countries in terms of sustainability of growth, competitiveness, job creation, and poverty reduction. In the past three decades, the neoclassical economic interventions have led most of the South-Asian countries. Sri Lanka was one of the first nations in South Asia to introduce open economic policy as early as in 1978. Although there had been a rapid economic growth since then, the education and training system has not adequately adopted to the changing demands. This issue is especially pertinent to the countries of South Asia, which are currently growing at a rapid pace and are gradually becoming more integrated into the world economy (Sedere, 2000[12]; Riboud, Savchenko and Hong Tan, 2007)[13].

Sri Lanka has now entered into a new era with high degree of political stability, free of terrorist threat and with a promise of ethnic harmony. The new political vision, *'the Mahinda Chinthana'* in Sri Lanka is to achieve excellence in education and accelerate the economic growth. Expanding trade and the globalisation of production and capital create pressures for economies to restructure to upgrade the skills of those employed in new industries. In addition, the increased global flow of information made possible by new information technologies creates demand for higher-level cognitive skills and for continuous learning over the work life, as the skills people acquire in school and in the workplace become obsolete more quickly and they need new and more complex skills to respond to accelerating technological change. How education and training systems respond to these sweeping changes and the challenges they pose will have far-reaching implications for the economic growth and competitiveness of South-Asian countries and for income (Riboud, Savchenko and Hong Tan, 2007).

Despite ongoing progress and clear commitment to education in all the countries of South Asia, measures to speed up the transformation of education and training systems in South Asia to catch up with East Asia and the rest of the world over the medium term has to be addressed. Some indications even suggest that the gaps relative to some East-Asian competitor countries may be widening rather than closing it.

The supply of skills is clearly lagging behind demand. Returns to higher secondary and tertiary-level education have remained high, and even increased relative to returns to lower levels of education, despite sizable investments by governments in the region, indicating that education policies and programs have not yet fully responded to the high and rising demand for skills. Particularly the liberal arts education and the general education at the senior secondary levels have not contributed to the expected economic advancements. This phenomenon is particularly striking in China, South Korea and Thailand.

Riboud *et al.* (2007) further states that in recent decades, South-Asian countries have focused their efforts on promoting elementary education. Even though pockets of excellence can be observed at other levels of education and differences are noticeable across countries, secondary and higher education, vocational education and training, and in-service training have not yet received the same attention from the public sector, and most of the expansion that has taken place in these areas is due to the private sector. Post-school training is a particularly neglected area despite evidence of large, positive impacts of such training on wages. For example, the incidence of training in manufacturing is among the lowest in the world (Riboud, Savchenko and Tan 2007).

Expected Outcomes of Schooling and Education

The school system has to envision the expected outcomes or the expected profile of the graduating student at different stages of the education cycle. The school curriculum has placed less emphasis to this aspect and learning is loaded with subjects than what is required to produce the expected profile. What is the expected profile of the primary school graduate? What is the expected profile of a middle school or a junior secondary school graduate completing Grade 8 or 9? Similarly what is the expected profile of the graduating student at GCE O/L or Grade 11? Such questions need to be answered through the analysis of the expected profiles as outcomes or outputs of education system taking the changing times and the future perspectives into consideration. A child entering school in 2010 will graduate from school system in 2024. It is necessary for the curriculum developers to examine the Sri Lanka in the global perspectives to understand what are required knowledge, skills and qualities for the graduating youth in 2024 to be an effective, efficient and a productive citizen in that emerging Sri Lanka. The expected profile has to be analysed preserving the Sri Lankan identity and heritage. The knowledge economy demands soft skills – team players, cooperative attitudes, positivism, smartness and these cannot come from the traditional subject based teacher and cramming dominated schooling.

The knowledge economy expects every citizen to be an effective producer and consumer. This demands every citizen to acquire at least the minimum of, the basic skills. All primary graduates have to acquire basic competencies and no primary child leave primary or enter junior secondary school system without the mastery of these identified basic skills. Today the studies show that approximately 18% of Sri Lankan

children do not acquire basic skills and some goes through junior secondary school not having such minimum attainments. Similarly the junior secondary students have to accomplish at least the expected minimum levels before entering the senior secondary school. The education system needs to envision the expected profiles at different stages and monitor the school system along these lines.

Curriculum and Instructional Methodology for Knowledge Economy

The school curriculum: Sri Lanka has a general education curriculum leading to General Certificate of Education (Ordinary Level) and (Advanced Level). Further, the curriculum follows a 'Linear Progression' Model. The subject content, formal school time per subject, number of subjects and time frame for the completion of the grade levels are all fixed. Moreover, it is a centrally controlled unified curriculum with one textbook, one Teacher Instructional Manual, and one examination for all. In the recent years, there were efforts even to have centrally-controlled end of school term tests which are very much formative assessments than summative assessments. All aspects are very much fixed. Though there are attempts made over the years, particularly since 1972, to diversify the curriculum, bring about out of school learning through projects, School-based Assessments and other activities, the basic parameters of student learning and teacher instructional system has not significantly changed.

Beginning in 2009 school year, Sri Lanka has introduced a 'Competency-based Curriculum' which identified learning outcomes as competencies at five levels. The curriculum expects the teacher-student transactions to be more realistic, authentic and child centred. However, the instructional system, the practice of the new curriculum has also succumbed to the conventional practices at school and classroom and the conventional paper-pencil public examination.

It is well-known to all Sri Lankans that despite all efforts to modernise the curriculum and make learning more child-centred, the examination culture in Sri Lanka has become the bottleneck of positive change. The examinations are still paper pencil exams and a child's eleven years of schooling for a subject is assessed in a 3-hour test paper at GCE O/L, which is mostly testing knowledge in a traditional way. Although, the knowledge economy expects 'metacognition' to be the knowledge, soft skills, ideas and creativity as the outcomes of education, the heavy examination orientation and the conventional practices in examination may not facilitate this transformation in learning. Rote memorisation is the usual learning strategy—and often the only strategy—employed by high school students when they go to college (Nist, 1993)[14]. This is very much so in most of the South-Asian countries. Research shows that explicitly teaching study strategies in content courses improves learning (Commander and Valeri-Gold, 2001; Ramp and Guffey, 1999; Chiang, 1998; El-Hindi, 1997; McKeachie, 1988)[15]. Research also shows that few instructors explicitly teach study strategies; they seem to assume that students have already learned them in high school—but they have not (McKeachie, 1988). The 'Knowledge Economy' demands continuous learning, upgrading of knowledge, skills, creative strategic thinking and ideas. These could come only through metacognition centered methods of learning and assessment.

Co-curricular Activities: The expected competencies have centred around the human qualities, values, soft skills, tactical knowledge and knowledge deepening, co-curricular and sports activities, personality building, with the thirst for continuous learning and learning to learn. In general, metacognition is thinking about thinking[16]. More specifically, Taylor (1999) defines metacognition as "an appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the agility to make correct inferences about how to apply one's strategic knowledge to a particular situation, and to do so efficiently and reliably." Taylor(1999)[17]. Abdullah (2001)[18], states that the self-directed learners are "responsible owners and managers of their own learning process" This is wanted shift in instructional system.

To satisfy the knowledge-based economy, Sri Lanka has to develop a curriculum with greater flexibility, less compartmentalised, fostering the Sri Lankan identity and heritage, having room for cross fertilisation of creative thoughts and ideas and to promoting the development of the personality and the soft skills, respect for others, humanity in a wider sense with global perspective of the widening horizons.

Metacognition and Three Types of Knowledge and Examination Culture

Knowledge economy demands certain qualities. Therefore the learner should be able to separate the relevant data from the irrelevant, master the skills and sub-skills required to develop strategic thinking, and be goal seeking and persuasive. These qualities could come only if the school age students are prepared with such behaviours. If Sri Lanka wishes to develop towards a knowledge economy, then, in the next phase of curriculum change in Sri Lanka need to address these.

To increase their metacognitive abilities, students need to possess and be aware of three kinds of content knowledge: **declarative, procedural, and conditional** (Peirce, 2003; Shannon, 2008[19]) *Declarative knowledge* is the factual information that one knows; it can be declared — spoken or written. This type of knowledge is present in the learning system of today.

This type of knowledge is what can be memorized. *Procedural knowledge* is knowledge of how to do something, of how to perform the steps in a process; for example, knowing the mass of an object and its rate of speed and how to do the calculation. *Conditional knowledge* is knowledge about when to use a procedure, skill, or strategy and when not to use it; why a procedure works and under what conditions; and why one procedure is better than another. Peirce further explains how the three kinds of knowledge apply to learning strategies as well as course content. A student's declarative knowledge means not only the simple factual knowledge. For example, knowledge and understanding all reading assignments are not alike, a history textbook chapter with factual information differs from a primary historical document, which is different from an article interpreting or analyzing that document. Students need to know that stories and novels differ from arguments. Further students need to know that there are different kinds of notes taking strategies useful for annotating these different types of texts. And students need to know how to actually write different kinds of notes (procedural knowledge), and they need to know when to apply these kinds of notes when they study (conditional knowledge). Knowledge of study strategies is among the kinds of metacognitive knowledge, and it too requires awareness of all three kinds of knowledge (Peirce, 2003).

Where do we stand on these as practitioners of education in Sri Lanka? Even if a teacher attempts to transfer such procedures, would our students take these seriously, particularly if our examination simply tests factual knowledge? Unless and otherwise that Sri Lanka comes up with major reforms in public school examination culture and bring in school-based assessment culture, all efforts of introducing innovative changes will simply die at the examinations. Although the Asian Development Bank loan investment renamed the Department of Examination as National Evaluation and Testing Service (NETS) and recommended such changes the impact of such investment on the quality of examinations was negligible (Sedere *et al.*, 2009)[20].

English, other Foreign Languages and Knowledge Economy

In view of the growing market demand and realisation of the growing need, a special Presidential Initiative was taken in the year 2008 to teach English and Information Technology (IT) for all at schools. A special taskforce was formed and a special unit was established at the Ministry of Education. In 2007, the Ministry of Education also developed the Peradeniya Teachers College as a Centre of Excellence for Teaching of English. Further bi-lingual education policy is introduced allowing the schools to offer certain subjects, up to five subjects in the English medium if teachers are available to conduct such classes. These efforts are all in the right direction to facilitate the knowledge economy. However, these efforts needs to be further strengthened and particularly expanded to rural schools as well. The prevailing disparity in the distribution and deployment of teachers is causing a great apathy in education system. Sri Lanka has sufficient number of teachers to teach in English but poor deployment of the teachers has contributed to the disparity against the rural schools.

Though the government has given computers to 3500 schools by 2010, these computers are not efficiently used at school level. Many schools do not make the full use of these machines. Similarly the 90 Computer Resource Centres (CRC) supported by the Educational Zones are seriously under utilised and most of the rural areas have become smaller and smaller than developing to become a centre for IT and computer education. The 'Nenasala' also has provided over 600 centres around the country and these efforts have to taken more seriously by the authorities. The 'Transactional Management Culture' in all education sector institutions needs to be replaced with a Transformational Management Culture.

Alternative avenues to bring private sector 'cyber cafes' to schools with adequate controls and filters and introduce coupons for the children to use such facilities may workout better because most of the schools cannot maintain computers efficiently to ensure functioning of all computers. In many schools, 50% or more of the 20 computers do not work due to failure in resolving simple software and hardware problems.

Information Technology and Knowledge Economy

Technology is the basis of capital deepening. A carpenter of yesterdays, today and tomorrow will differ in the use of equipment. He has shifted from the manual systems to mechanical systems. In the near future, they will shift to more digital technology. The same is true for all trades. The change of older definition of 'labour' to 'human capital deepening' has happened through the use of new knowledge and technology, and today's technology is mostly computer and IT based. Knowledge of computer is needed in every aspect of human capital deepening to bring precision, accuracy and improve quality of products and services. These are basic skills and no secondary school graduate could leave the system without acquiring such skills.

Formal School and Room for Creativity

Knowledge economy demands creative thoughts. Ideas do not mean general thinking. Ideas that could turn the wheel of economy have to come with creativity. This needs "improved visual perspective" and "an ability to synthesise diverse elements into

meaningful products'. This is the basis of creativity. The Education Revolution Newsletter on Alternative Educational Resources (September 2010) says that "back in 1958, Ted Schwarzrock was an 8-year-old third grader when he became one of the "Torrance kids," a group of nearly 400 Minneapolis children who completed a series of creativity tasks newly-designed by professor E. Paul Torrance. Schwarzrock still vividly remembers the moment when a psychologist handed him a fire truck and asked, "How could you improve this toy to make it better and more fun to play with?" He recalls the psychologist being excited by his answers. In fact, the psychologist's session notes indicate Schwarzrock rattled off 25 improvements, such as adding a removable ladder and springs to the wheels." Where do we such space in the Sri Lankan system of education and our classroom practices? Could we create such space in our schools? How do we go about these? All those who are interested in turning the wheel for a change to bring a wave of creativity through education have to find these avenues leaving the current crammed practices. Curriculum, instructional settings and teacher education and assessments all have to follow such principles and create room for creativity and this is seriously lacking in our general education system in Sri Lanka.

Instructional Methodology and Knowledge Economy

Education is a behavioural science. Education is a process and simply by having physical facilities, books and teachers, learning or the shaping of behaviour does not happen. The development of the child happens through a continuous interactive processes which are not necessarily in class or in school, it happens at everywhere the child encounters situations and interacts. These are sometimes formal, sometime non-formal, and most of the time, are informal. Therefore, the learning environment and the learning climate matters as much as other materials and methods. It is important for all educators to have this in mind and reminded often because child's picking up of behaviour happens every where and all the time. Therefore, it is important to follow lasting more progressive approaches to interaction. The methods have sadly concentrated on pedagogy and end in classroom, most in a chalk-and-talk session. This needs to shift to more constructivist methods, self-learning principles more leaning gradually from pedagogy in primary schools to andragogy in secondary education (Knowles, 2000)[2], more autonomous learning principles than spoon-feeding, etc. Classroom process have to create room for innovative methods to spark creativity, ideas, develop independent learning and soft skills inculcating group learning, sharing and a cooperative culture. Deviation of teacher-centred, textbook and examination-oriented learning has to happen soon in Sri Lanka to pave the way for a Knowledge Economy and to improve relevance of education to the World of Work.

Transformation of Educational Institutions

The institutional transformation has to receive serious attention in the Sri Lankan situation where most of the Sri Lankan institutions are public sector institutions and they all follow one model and obviously functioning far below the optimal level. In the education sector starting from the Ministry of Education, the Provincial, Zonal, Divisional officers, with 9,965 public schools, then the mega institutional network the National Institute of Education, the 18 National Colleges of Education, 10 Teachers Colleges, 99 Computer Resource Centres and 101 Teacher Centres to support the teachers to upgrade qualifications and skills. There is an Examination Department and the Department of Educational Publications under the Ministry of Education. The Higher Education Ministry has 17 State Universities, 7 Postgraduate Institutes, 10 Affiliated Institutes, and 7 UGC-recognised private universities. The Vocational and Technical Training has another set of educational institutions. These institutions offer seven levels of courses. Several agencies fall under the Ministry of Vocational and Technical Training (MVTT): The Tertiary and Vocational Education Commission (TVEC), The National Apprentice and Industrial Training Authority (NAITA), University of Vocational Technology (UNIVOTEC) (formerly National Institute of Technical Education in Sri Lanka, NITE-SL), The Department of Technical Education and Training (DTET), the Vocational Training Authority (VTA) and the National Youth Services Council (NYSC). VTA will have 36 institutions and another 6 Special Training Centres. The National Apprentice and Industrial Training Authority, offer over 180 courses. There are many other training institutions under other ministries such as the 20 nursing schools, 12 farm schools. In view of the knowledge economy, all these institutions need to be transformed to meet the expected economic relevance, institutional effectiveness and efficiency. The cost-effectiveness or accountability are never the concerns of the government institutions. In general, public sector institutions are stereotype models under performing either due to lack of ideas or due to regulatory systems or poor utilisation of human capital, transactions-oriented management culture than a knowledge-based-transformational culture and lack of good governance. There is no knowledge base management, if not in all, in most of all institutions in the public or the State sector. These institutions have an opinion-driven transactional management model, resulting serious failure of transforming the institutions to higher standards meeting with the changing times and escalating global standards. A decade ago, Sri Lanka at least had one university amongst the best 100 universities in Asia and today there is none even within the best 200

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universities in Asia. Despite of higher investments, the sliding has happened. The transformation do need funding, yet, funds alone cannot do the changing emphasis as it needs envisioning of the knowledge economy-based human resource or the human capital deepening as outcomes.

Footnotes:

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