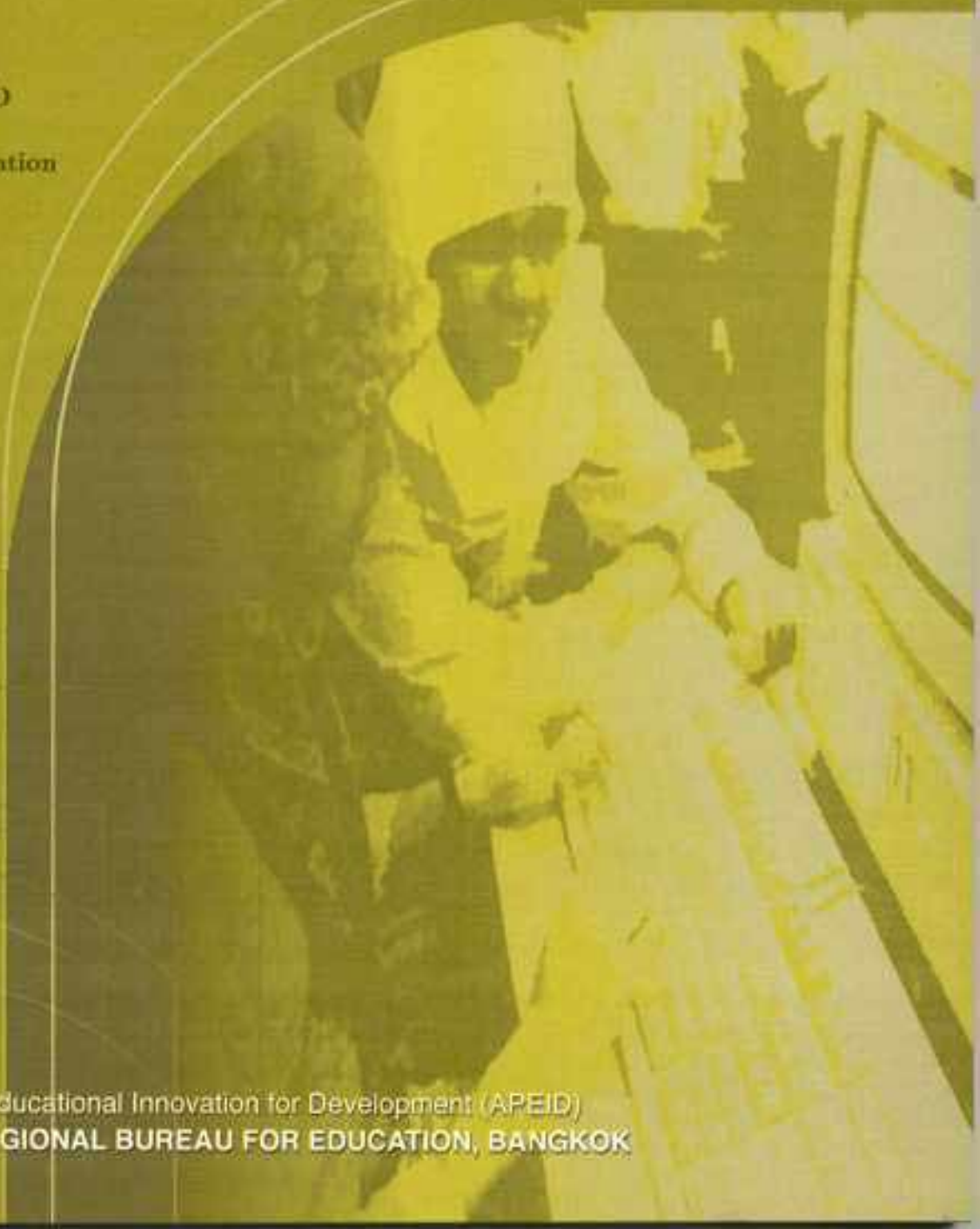
# Report of the Sixth UNESCO-ACEID International Conference on Education

# Information Technologies in Educational Innovation for Development: *Interfacing Global and Indigenous Knowledge*



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# Preface

This report is the outcome of the Sixth UNESCO-ACEID International Conference on Education, entitled "Information Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge."

The purpose of this conference, held in Bangkok, Thailand from 12-15 December, 2000, was to address the role of information technologies in educational innovation for development. The conference focused on the interfacing of global and indigenous knowledge and explored its implications, especially for the content of education and teacher education.

Information and communication technologies are having a profound impact on learning and teaching in almost all countries, and in all models of education. The impact of these technologies is likely to continue unabated. Therefore it is important that educators keep themselves abreast of the latest thinking, now made available through this publication.

The tension between global and local knowledge is one of several tensions to be overcome in solving the problems of the 21st century. This endeavour requires the recognition that global and indigenous knowledge are unique and different. This is demonstrated in how each generates, regards, stores, disseminates and evaluates its form of knowledge. Furthermore, there is a need to recognize that each tradition of knowledge contains components which are pivotal to a learning society, and others which are in need of modification. This publication deals with this tension, by focusing on global knowledge and indigenous knowledge, and how interfacing them may contribute to the learning society of the future.

This publication provides background papers focusing on three key themes:

- global knowledge, indigenous knowledge, information technologies and multiple intelligences: towards a learning society
- interfacing global and indigenous knowledge in educational content and teacher education
- partnerships for applying information technologies, and global and indigenous knowledge in educational innovations.

We are sure this publication will help add to the understanding of issues central to the improvement of the structures and the processes of education.

We are grateful to the authors for their academic contributions, to the organizers of the conference for bringing people together on a common platform, and to the supporting staff that have given shape to this volume.

Zhou Nanzhao
Coordinator APEID
UNESCO Asia-Pacific Regional Bureau of Education
Bangkok, Thailand

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# Welcoming Remarks

*Dr Zhou Nanzhao*
*Acting Director, UNESCO Asia-Pacific Bureau of Education, Thailand*

Your Excellency Mr Anand Panyarachun,
Excellencies,
Distinguished plenary speakers, participants and guests,
Ladies and gentlemen,

Good afternoon! On behalf of UNESCO's Asia-Pacific Bureau of Education, I take great pleasure and pride to formally welcome all of you to the 6th UNESCO-International Conference on Education. In particular, we are highly honoured to have with us His Excellency Mr Anand Panyarachun, twice Prime Minister of the Royal Kingdom of Thailand, who has graciously agreed to open this conference. UNESCO acting Assistant-General for Education, Mr Jacques Hallak, has asked me to convey to you his congratulations, and has further asked Dr Cecilia Braslavsky, Director, International Bureau of Education, to address the conference on his behalf.

This conference has been organized in collaboration with UNESCO's long-standing partner, the Office of National Education Commission of Thailand, under the leadership of Dr Rung Kaewdang, with assistance from the Hong Kong Institute of Education and the Centre for Learning and Teaching Styles in the Philippines. On behalf of our co-sponsors, I extend a hearty welcome to all distinguished participants and guests coming from afar, as well as Thailand. I am pleased to report that we have nearly 400 participants from 15 countries around the world.

The theme of this Sixth ACEID Conference is particularly timely and relevant, as we continue to encounter the profound impact of information-communication technologies (ICT) on education and its innovation-for-development goals. This theme is one which we believe is of utmost importance now, at the turn of the new millennium. Globalisation will be a characteristic feature of the twenty-first century. The profound impact of ICT on education calls for a fundamental rethinking of how knowledge will be organized, accessed, and distributed in tomorrow's world; it also mandates us to ponder how global and indigenous knowledge could be better interfaced through ICT, and how the universally or locally relevant values embedded in knowledge could be integrated, in light of the educational goals they will serve.

ICT as applied to education is actually a very complex theme. It is more than simply learning more about information technology and how it operates. It is more than looking at the latest thinking on how we can further develop and educate our people. It is more than just observing the impacts of globalisation on nation/states or communities. You must also plan to harness the potential of ICT for reaching out, and avoid the risks of its misuse. I welcome you to these deliberations on the changing roles of ICT from educational, sociological, economic and technological perspectives.

On the one hand we have been made increasingly aware of the powerful and unprecedented potential of information technologies for educational development: ICTs break barriers of space and time for new learning opportunities to be accessible to a wider and wider audience, to reach out far beyond the classrooms, to the unreached and the under-served. ICTs bring the outside world to the classroom, and enable learners to develop broad global visions and international understanding. ICTs provide possibilities of improving the content and effectiveness of the

teaching-learning process and are therefore a means to combat under-achievement and enhance the quality of education. ICTs can also contribute to improved management and efficiency of education.

On the other hand, we need to be reminded of the possible risks and pitfalls in the use of ICTs for educational purposes. If not properly used, they might further widen the 'digital divide' between information haves and information have-nots. They might contain educationally inappropriate information. They may create fear of cultural dominance, erode local cultural identity and endanger cultural diversity, as in some ways the wide use of sophisticated technologies can be seen as a threat to some of our existing beliefs, values and practices.

Truly, the significance of ICTs is more than technological; it is essentially educational, as well as economical and social. How we respond to such paradoxical challenges is absolutely fundamental to how relevant our educational policies and practices will be for the people of our region and of the world at large. Therefore, participants at the conference may want to deliberate on roles of ICT from diversified and broad perspectives.

I encourage you to present innovative practices in using ICTs to interface between indigenous and global knowledge. What is indigenous knowledge? How do we define global knowledge? How does one type of knowledge support, challenge or threaten the other? Are these knowledge systems creating tensions of minor consequence, or do they have the potential to cast an all-encompassing shadow over wider areas and across generations? During the conference we will undertake collective efforts to find answers to theses questions.

This conference can be seen as part of UNESCO's efforts to fulfil its mandate of contributing to peace and human development through education, science, and culture in an age of globalisation, as related to universal communication through new information technology. This conference is in line with the three strategic axes of UNESCO's programmes, namely, *protecting public common good, promoting education information for all, enhancing cultural diversity and promoting information/knowledge sharing.*

During our conference, we will fully explore the many potentials of ICT to stimulate innovation and creativity in all areas of content, pedagogy, and management, in achieving equal opportunity for all and improving quality and excellence. In our deliberations participants won't lose sight of the fact that information technology, no matter how advanced and fascinating, is a tool to serve the goal of education, which is 'the complete fulfilment of man in all the richness of his personality, the complexity of his forms of expression and his various commitments as individual, member of a family and of a community, citizen and producer, investor of techniques and creative dreamer.'

This is the very aim of development, for which we try to employ information-communication technologies. Our deliberations over the next few days will analyse each of these aspects of technology. Importantly, however, we will be unfolding the interrelationships of each, and determining what actions and innovations are appropriate for us as educators.

As conference organizers, we hope that this conference will enrich our perspectives and deepen our understanding of the roles of ICT in interfacing global and indigenous knowledge. We also hope to come up with proposed strategies and meaningful recommendations for actions, which will make a difference in innovating our education systems and practices, and be useful for human development and for building a learning society in a more peaceful world.

Let us ensure that the blending and inter-twining of the tensions that are emerging are adequately addressed at this conference. Let us again remind ourselves of the purpose of this conference, as suggested by the theme. These are to address the role of information technologies in educational innovation for development, which focuses on the interfacing of global and indigenous knowledge, and to explore the implications, especially for the content of education and teacher education. It is our earnest hope that this conference will help us determine how, through innovative approaches in the use of information technologies, we can assist in the interfacing of global and indigenous knowledge, and contribute towards overcoming global-local tensions.

Thank you all.

# Introductory Message

*Dr Cecilia Braslavsky*
*Director, International Bureau of Education, Geneva, Switzerland*

Your Excellency, Dr Anand Panyarachun, former Prime Minister, Kingdom of Thailand
Dr Zhou Nanzhao, Acting Director, UNESCO Asia-Pacific Bureau of Education
Dr Rung Kaewdung, Director-General of the
Office of the National Education Commission, Thailand,
Friends, Ladies and gentlemen,

It is a great honour for me to represent the Assistant Director-General of the Education Sector of UNESCO, at the opening ceremony of this sixth ACEID International Conference, as well as to speak on behalf of my own institution, the International Bureau of Education (IBE).

I will begin this address with two brief anecdotes as links to every day life. The first one will allow us to reflect on the contradictions involved in the introduction of new technologies in our daily lives, and the second on the challenges of introducing indigenous knowledge into the curriculum.

250 years ago the steam engine was invented. Remarkably, one of the first ideas to occur to some pedagogues was to introduce the invention into educational practice by creating a machine which could be used for punishing children more efficiently and effectively by using a paddle moved by steam. The other anecdote concerns a university professor who had previously been an excellent teacher in a rural school. While there, he had been very concerned about the poverty of the community and decided to teach the pupils how to milk cows. However, the parents of the pupils went to see him in great concern, to tell him that they had already taught their children how to milk cows. What they wanted was for them to learn how to read difficult books! They added that they felt they could milk cows better without the teacher's help.

In this age of information and communication technologies, when we are also increasingly recognizing the value of local knowledge, we have to ask ourselves not *whether* or *how* are going to introduce ICTs and local knowledge into our schools, since it is clear that we have to do so, but *why* and *what for*?

The role of information and communication in development has long been a primary concern of UNESCO, with one of its main programme areas being "Communication, Information and Informatics." UNESCO has always advocated free circulation of information and freedom of expression, which it sees as elements integral to the building of democratic, egalitarian societies. Our organization seeks to promote the right to information as a fundamental human right.

With the rapid developments which have taken place in the field of information and communication technologies during the past two decades, UNESCO has sought to define a global framework within which these technologies should be developed and exploited as equitably and as ethically as possible. We are concerned that these technologies be used to advance development in the widest sense, not merely in terms of economic and commercial interests, but also to disseminate knowledge and values in all fields, to foster artistic talent and promote genuine public debate on issues of common concern. UNESCO's concern has been to widen access to these technologies throughout the whole world. In many countries, levels of poverty

and unequal distribution of resources limit drastically the opportunities for the majority of the population to benefit from such technological developments.

UNESCO has recognized the huge potential ICTs have for widening access to education, and for lifelong learning. We are aware of the capacity of ICTs to provide greater flexibility in learning situations, increased interactivity for learners and connectivity to people and learning resources all over the world. However, UNESCO is also aware of the capacity of the same technologies to promote individualism, and to reduce the importance of institutions in society, particularly in education. In more affluent societies, suggestions are being developed to replace the school with computers in the home. But if the world community eventually accepts that schools be replaced by computer-based learning at home, the already existing gaps between rich and poor will simply increase. Such a development would have a doubtful impact on education for living together, decreasing our chances for harmonious coexistence.

UNESCO is developing programmes to increase access to ICTs for the purposes of strengthening educational provision and delivery for all communities, particularly those to which access has traditionally been denied or limited. We seek to enhance the opportunities for use of ICTs while promoting co-operative learning and preventing the digital divide.

UNESCO's Major Programme Area One, *Education for All throughout Life*, aims to contribute to the development and application of cost effective approaches for the use of ICTs in education, especially in developing countries. Examples of such projects include 'Interactive Television Projects for Teacher Training' in India and Morocco, and 'Learning Networks for African Teachers.' The 'Learning Without Frontiers' Programme co-ordinates these projects within the Education Sector.

UNESCO recognizes the challenges and contradictions involved in promoting the universal use of ICTs, which are so far mainly channels for the dissemination of only certain cultures and values around the world. The predominant use of English on the Internet puts non-English speaking countries and persons at a clear disadvantage. However, the new information and communication technologies have great potential to increase knowledge of other cultures, adding to possibilities for their preservation and development. Greater use of the Internet and other new information technologies needs to be ensured for the preservation, development, dissemination and application of indigenous knowledge.

What exactly is global knowledge as opposed to indigenous knowledge? All knowledge felt to be of potential use to humankind should be considered 'global.' We should all have the right to have access to such knowledge. Unfortunately, only knowledge mainly generated and disseminated by certain communities in some Western countries has come to mean global. Furthermore, the increasing dominance of a homogenized culture in all media is leading to its evermore rapid and widespread influence around the world, and among young people in particular. However, it should be recognized that in today's world there is increasing cross-fertilization of all cultures and knowledge, and that such cultural exchange and intermixing has existed throughout human history. UNESCO recognizes and contributes to the rediscovery of diversity. Humanity must find better ways to take advantage of it.

UNESCO has a vital role to play in strengthening the capacity of countries to develop educational programmes which are relevant to local realities, needs and values, while at the same time recognizing the value of learning from other cultures. Through capacity building and information provision, we can assist countries in developing curricula and methodologies which ground learners in their own cultures, while giving them access to the knowledge and competencies necessary to be citizens of the world.

Allow me to introduce a third anecdote, as a link to every day life. The IBE is giving technical assistance to a project to build a school network by introducing new technologies. A private firm contributes and guarantees that all schools have the needed computers. But during a visit, we discovered that among the thirty village schools, only twenty had access to the telephone! Efforts to introduce the new technologies have to be embedded in complex policies, programmes and innovations that permit the promotion of connectivity. But in trying to improve connectivity we will realize that we are not only facing new challenges but also confronting many old ones.

Before I end, I wish to congratulate UNESCO Asia-Pacific Bureau of Education for organizing this sixth ACEID Conference, as one of the major activities in promoting educational innovation in the Asia-Pacific Region. The annual conference has become a major educational event in the region and the world. The Asia-Pacific Programme of Educational Innovation for Development (APEID), set up about four decades ago as the flagship programme of UNESCO Asia-Pacific Bureau of Education, is the one of the most active of the educational innovation networks established by UNESCO around the world. The theme chosen for this year's conference is very timely in preparing our learners for this new millennium, influenced so greatly by the advances in information and communication technologies, and the related tensions between local and global challenges.

Furthermore, this conference serves as one of the most relevant preparatory events for the 46th Session of the UNESCO International Conference on Education (ICE), which will be held in Geneva in September 2001. The theme of ICE is related to the extremely important challenge of improving the quality of education for all: "Educational Content and Methods for Living Together in the 21st Century: Problems and Solutions." In particular, two workshops will give Ministers of Education the opportunity to incorporate in their debates the main ideas and suggestions you propose in this sixth ACEID conference. The themes of these workshops will be: "Common Values, Cultural Diversity and Education: What to Learn and How?" and "Reducing the Gap between Rich and Poor in Terms of Access to Information: New Technologies and the Future of the School."

I end by appealing to you to help us at UNESCO to recognize and take into account the complexity of the educational challenges of the 21st century, and to develop concrete and pertinent actions to better harness the benefits, while reducing the risks, of introducing ICTs into education. Let us work together to use the opportunities offered by the new technologies to really identify and exploit all available knowledge necessary to construct a better quality of life for all human beings, and strengthen diverse identities. Let us work together to humanize globalization using all available technologies and knowledge.

Thank you very much, ladies and gentlemen.

# Official Opening Address

*His Excellency Mr Anand Panyarachun*
*Former Prime Minister of the Kingdom of Thailand*

Excellencies, Distinguished Guests and Participants, Ladies and Gentlemen,

It is an honour for me to welcome all of you, most warmly, to this international conference on "Information Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge."

Every day, newspapers, professional journals, television broadcasts - even the shopping malls - remind us of the new technological world in which we live. We are bombarded by images of new technological wonders, all promising to make our lives better. Information and communication technologies are binding everyone in the world together in a real way, never imagined before. We are told these technologies offer great hope for humankind - and they potentially do. They offer the promise of unlimited access to information for all, in a way only dreamt of in the not-so-distant past. They offer the promise of providing a more level playing field in the globalized economic world of tomorrow. They promise to connect people across distances of time and space as never imagined just a few years ago.

But, as we are all becoming increasingly aware, for all the tremendous promise the new information communication technologies are bringing to the world, there are also disturbing perils. One such peril would seem to be the increasingly isolated lives people are living, especially in urban environments all across the planet. Perhaps, partly to escape the crush of over-population and the anonymity that comes with urbanization, ICT technology seems to offer solace and escape. If you can't get along with your family, then you only have to find a chat room or an 'affinity group' of people more like yourself. But is this necessarily a good thing? Certainly not if it leads to the 'anti-socialization' of peoples. For just as the people of the entire world are becoming connected in cyberspace, they seem to also be becoming disconnected in real-time and space. I don't know if there is a causal connection in this or not, but I think it is worth pondering.

Also among the perils brought on by the advent of ICT technologies, is the very real possibility of smaller, so-called 'indigenous cultures' being left behind, forgotten, after hundreds, even thousands, of years of development and evolution. Just as unique species of plants and animals in the rainforests are disappearing, we are facing the potential disappearance of unique human cultures and their intellectual heritages - some only to be kept 'alive' to fuel a new tourism that seeks comfort in finding something of the past.

Often when we hear the term 'indigenous knowledge' many of us immediately think of traditional handcrafts and herbal medicines. And it is true, these are kinds of indigenous knowledge. They have been accumulated over centuries and painstakingly handed down from one generation to another. Today they are in jeopardy of being lost in the unyielding march of modernization and the implementation of technology. But I think there is much more at stake here than first meets the eye. There is much more to indigenous knowledge than quaint arts and crafts and traditional medicine, important and worthy of consideration as they are. To me, indigenous knowledge encompasses much more than this. Indigenous knowledge also includes agricultural knowledge, knowledge of local flora and fauna, even the local history of the earth and weather systems. It

includes languages and dialects, different styles of cognition, and different systems of logic. It includes different means and traditions of social interaction, different methods of conflict resolution, different means of achieving social cohesion, different methods of child-rearing and old-age care, different ways to mark rites of passage. The possibility of losing these kinds of human achievements is simply unacceptable. Still, fuelled by the onslaught of technology, these are some of the aspects of what is called indigenous knowledge that are at risk today.

Sometimes through the din of modern technology and life, there seem to be some indications that more value is being placed on so-called indigenous knowledge. In 1995, the United Nations declared "The Decade of Indigenous Peoples." That sounds good, but I am not entirely sure what it means. After all, aren't we all indigenous to some place? And are not all cultures under pressure and exposed to the threat of losing our cultural identities, our traditions, our values, our cultural knowledge? Are we not all harnessed to the same great engine of change?

Perhaps the question that begs to be asked first is, who is indigenous and who isn't? Secondly, what is indigenous knowledge that differentiates it from other knowledge? Once we have identified it, perhaps the toughest question of all is, just what indigenous knowledge do we want to maintain, save and nurture into the next century and beyond? Who is going to make those decisions and upon what criteria should those decisions be made? These are deep questions and too often I fear we have a tendency to gloss over the hard questions, erect a new 'politically correct' edifice and label, and then just go on doing nothing much very differently.

I applaud this conference for offering an opportunity to explore these and many other related questions. I hope and trust that you will give yourselves this week to fully examine some of the fundamental and difficult questions that you will be confronted with. But please keep in mind, words without actions are just words. A conference, no matter how noble and well intended, that does not result in action, that does not stimulate change, that does not lead to invention and innovation, that does not result in a serious re-consideration of its themes, is very hard to justify. It is my hope that you, many of whom have travelled so very far to get here, will take your time here seriously, participate fully, and seek to apply what you learn here to yourselves and to your professional environments when you return to your homes.

I hereby declare this international conference on "Information Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge" officially open. I wish each of you well. I trust that your stay in Thailand will be pleasant and most memorable. And I wish you every success in the work before you in addressing these important issues and topics.

# Raja Roy Singh Lecture

*Dr Vladimir Kinelev*
*Director, UNESCO Institute for Information Technologies in Education (IITE)*
*Federation of Russian States*[1]

Esteemed Master of Ceremonies,
Excellencies,
Distinguished Participants,
Ladies and Gentlemen,

First of all, I would like to express my gratitude to the esteemed organizers of the Sixth UNESCO-ACEID International Conference "Information Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge," for the high honour of delivering the Raja Roy Singh Lecture at such a representative forum. I presume it would be appropriate to express my strong belief that this conference will become an outstanding event, not just for the people who have gathered in the beautiful capital of the Kingdom of Thailand, but also for many thousands of decision and policy-makers, academics, and educators – all those who think and act in different parts of the world and are striving to prepare humankind to respond adequately to the challenges of the 21st century.

## Man and Civilization Development

This conference is held at the dawn of the third millennium. Therefore we have perhaps the last chance in this century to gather here today and jointly try and take a look into the future, in an attempt to define the key features of the human civilization in the 21st century.

The advent of a new millennium should not be perceived as just another divide in the calendar of history. It is a major divide which urges us to reflect on the past and on the meaning of life, to try and discern the contours of the future, and, most important of all, to unite our efforts in shaping a better future for all those who live on this beautiful and unique planet Earth.

Probably for the first time in history, the passing century has clearly demonstrated the strong dependence of education on the processes unfolding in economics, society and in all spheres of human activity. This was particularly evident in the past decades of this century, when the national educational systems in most of the world's countries experienced profound transformations, of both quantitative and qualitative nature. These transformations, to a considerable degree, have been brought about by dynamic scientific progress and socialization of its consequences, affecting all aspects of society's life.

Today as never before, it has become clear that no educational problems could be solved or even comprehended beyond the general processes unfolding in the world that surrounds us. When discussing global issues of social and economic development, including education, that humanity will have to address in the 21st century, first of all we shall answer the questions: What is the significance of the age as a prelude to the new era? Which parts of its legacy will be carried over into the future and which will be left behind?

1. The address was read by Dr Alexei Semenov from Moscow.

I would hope to be right in suggesting that one of the most striking characteristics of contemporary life, and increasingly of the future, is the accelerated pace of change. The world never stands still. Its swift changeability has turned into a constituent feature of global historical development. Even in private life, change tends to oust continuity and stability. We have entered a transitional period marked not just by the calendar watershed but also by a historical divide, beyond which there lies a lot of uncertainty.

The current pace and magnitude of change break the traditional framework of historical gradation. The essence of our era can no longer be conveyed by the same category of 'era' as implied in 'the era of steam,' 'the era of electricity,' or 'the era of great geographical discoveries'. For the first time in the history of our civilization, generations of products and ideas come and go faster than generations of people succeed one another. Moreover, changeability reveals itself through earlier unparalleled diversity, thus making it impossible to define our era through any single event or development in the life of society.

One of the most complicated contemporary problems for humanity to solve is man in the changing world. Today, man has become the main factor of development, as well as the main risk factor. For centuries people had to adjust to nature and social changes, building up, as they went through such adjustments, institutional, technological and intellectual potential. As a result, the magnitude of this potential has reached global proportions, and people have been taken hostage by the artificial nature created by them. Consequently, a fundamental and equally destructive incongruity has become apparent between human existence and the global scale of supernatural powers and possibilities available to people.

The turning point between the two millennia is drawing closer. We shall soon see the departure of the 20th century, that showed the world some earlier unknown features of a new civilization. Man made a breakthrough into outer space, reached far into the ocean depths, designed sophisticated machines like Hephaestus, harnessed nuclear energy and became its hostage, learned to use the wealth of nature at an unprecedented scale, but succeeded much less in healing the wounds he inflicted upon nature.

People have proved maladjusted to the new rate of civilizational development, although some earlier signs of the remarkable acceleration in science and technology, including energy generation, exploration of outer space, and information technologies were discernable already in the 30s and 40s of the 20th century. Spanish philosopher Ortega y Gasset remarked on this circumstance in 1930, by saying:

> *Today catastrophe is visiting Man himself who has become incapable of keeping step with his civilization. Growing civilization is nothing else than a painful problem. The greater the achievements, the bigger the dangers of civilization.*

Seventy years later one can say that Ortega y Gasset's diagnosis has been confirmed many times. Our knowledge has come to resemble a kind of Pandora's box, from which disasters come flying out and spread around the world. This is indicative of a less than satisfactory state of public morals, educational philosophy and industrial-technological practices. In fact, society has reconciled itself to the existence of a 'one-dimensional man,' narrow occupational training, and a limited and lopsided world outlook. The kind of differentiation and socialization that are allegedly dictated by the logic of scientific progress are, in fact, pushing the world to the brink of catastrophe.

In this context, it becomes obvious that the entire system of knowledge of the world, human existence and society must be exposed to a painful re-evaluation. To an extent we may have to return, although at a higher spiral of development, to the integral knowledge, philosophy and uniform order of the universe, in other words, to 'fundamentalize' education on the basis of organic unity of its natural science and humanitarian components. It is imperative to bring into a coherent system, acceptable to the world and human beings, the entire body of knowledge, religious faiths, cultures and technologies. It could be wise to start with developing a universal model of a harmonious world, wherein man could see and appreciate his sensual/visual, scientific and material interrelationship with the surrounding world. Based on this, the study of peoples, countries and cultures, religions and ecology, computer science and mathematics, physics and biology, and many other subjects could make up a comprehensive curriculum for 'a universal man' whose actions will have meaning and the purpose of gaining 'universal knowledge' of the 'integral world.'

Today, as perhaps never before, it is necessary to secure practical realization of the triad 'ecological upbringing – ecological enlightenment – ecological education'. All the parts of this triad are closely interrelated. They constitute the basis for cultivation of an ecological world outlook in the population, based on awareness of the need to preserve the vital environment for humankind, which is now, in effect, the entire biosphere of the Earth.

The point is that the instrumental possibilities of modern thinking have acquired global proportions. They contain both unprecedented potential and new threats. Which of the two will prevail in reality largely, if not decisively, depends on education and educational institutions. Here lies the risk. But it is here too that there is hope!

## New Education for a New Society

Scientific and technical progress, along with the global spread of technologies developed in the most advanced countries of the world, constitute some of the main arguments in favour of the leading role of education in today's world and especially in the coming 21st century.

The level of technological development is indicative nowadays not only of the economic power and living standards of a particular country, but also of the place and role of this country in the global community, and the scope and prospects of its economic and political integration with the rest of the world. At the same time, the level of development and utilisation of modern technologies is determined in different countries not only by the development of their material resources, but to a large extent, by the degree of 'intellectualization' of society, i.e. society's ability to produce, consume and apply new knowledge. These developments, in turn, are tightly linked to the level of educational development.

The report of the International Commission on Education for the 21st Century, "Learning the Treasure Within," submitted to UNESCO, stresses the crucial role of fundamental and thorough knowledge in allaying some major tensions which, although far from being novel, will pose a formidable challenge in the 21st century. These challenges include:

- The tension between the global and the local: people need gradually to become world citizens without losing their roots, and while continuing to play an active part in the life of their nation and their local community.
- The tension between the universal and the individual: culture is steadily being globalized, but as yet only partially. We cannot ignore the promises of globalization nor its risks, not the least of which is the risk of forgetting the unique character of individual human beings; it is

for them to choose their own future and achieve their full potential within the carefully tended wealth of their traditions and their own cultures which, unless we are careful, can be endangered by contemporary developments.

- The tension between tradition and modernity, which is part of the same problem: how is it possible to adapt to change without turning one's back on the past, how can autonomy be acquired in complementarity with the free development of others and how can scientific progress be assimilated? This is the spirit in which the challenges of the new information technologies must be met.
- The tension between, on the one hand, the need for competition, and on the other, the concern for equality of opportunity: this is a classic issue, which has faced both economic and social policy-makers and educational policy-makers since the beginning of the century.
- The tension between the extraordinary expansion of knowledge and human beings' capacity to assimilate it.
- The tension between the spiritual and the material: often without realizing it, the world has a longing, often unexpressed, for an ideal and for values that we shall term 'moral.' It is thus education's noble task to encourage each and every one, acting in accordance with their traditions and convictions and paying full respect to pluralism, to lift their minds and spirits to the plane of the universal, and, in some measure, to transcend themselves.

The historically unprecedented combination of changeability, a fast growing techno sphere, and new risks and contradictions in the development of human civilization set the task of searching for a new global world order. Many modern thinkers contend that humanity is undergoing a phase of cultural transition. It is characterised by the following significant factors: First, humanity is striving to forge a new basis for unity. It involves not only a single world market, or a unified political order. It embraces a growing spiritual unity within diversity of peoples and cultures. Second, a new image of science is taking shape. Science attempts to find a new basis for universality by overcoming the traditional alienation of the natural sciences from the humanities. Third, the relationship between the artificial and the natural, i.e. between the human civilization and nature, is being redefined. And finally, fundamental restructuring of education is taking place worldwide. To meet the requirements of the cultural transitional period, the educational sphere absorbs and passes over to the younger generation the characteristic elements of this transition, such as new humanism, a new image of science, and a new understanding of the relationship between civilization and nature.

There is no country today capable of solving these universal problems on its own. To accomplish this task it is necessary to unite the economic, intellectual and cultural potentials of the entire world community. Therefore, I believe it will not be an exaggeration to assert that creation of an educational system capable of preparing people to live in the changing world is one of the crucial and urgent tasks of modern society. Education is the only saving grace in overcoming the global crisis of modern civilization, creating necessary conditions for its survival today, and its sustainable development in future.

Hence the questions: What will 21st century education be like? What demands shall be made on education to help people adjust to the new, swiftly changing conditions of their life? What can be done today to meet those demands adequately? These questions are a matter of serious concern for academics and state and public leaders, who are grappling with the task of modernising and reforming their national educational systems, as well as key institutions, in developing the individual and society in the 21st century. Such a society can be referred to as a 'learning society.'

I believe that the distinguishing features of this evolving educational system will be:

- a shift of emphasis from 'teaching' to 'education'.
- a greater focus on fundamental knowledge and development of an individual's creative potential.
- the utilisation of new information and communication technologies in educational innovations for development.

## To Educate or to Teach?

Present-day educationalists often use these terms interchangeably as if they were absolute synonyms. In fact, 'educating' is not identical with 'teaching,' the difference lies in the quality of the result achieved. Teaching is geared towards the transfer of particular, and therefore limited, knowledge and skills. This approach has a long-standing tradition. The contemporary version of this type of school instruction can be defined as an algorithmic-instructive method. The use of this method in conjunction with modern information technology has not helped free up talents and aptitudes of school students so far, which is indicative of the fact that teaching as a form of transferring and accumulating knowledge is naturally handicapped. In other words, traditional teaching as a form of communicating knowledge is running out of potential. It is high time we looked for new solutions.

In this context education, if broadly treated, may release new resources of comprehensive development of an individual and help the progress of science. To this end, the information block of science should be divided into a few intersecting units. One of them is the traditional communication of knowledge about the universe arranged in an orderly manner. We call this kind of knowledge 'knowledge as description,' for it contains information about individual objects studied, and as such either sidetracks or completely excludes the idea of holistic knowledge. But there exists another kind of knowledge called 'knowledge as an instrument,' which incorporates cognition strategies and shapes adequately reflecting the whole of the environment, and not just individual objects of study. This type of knowledge cannot be confined to a single science framework. It is trans-scientific for it rests on methodological groundwork and meets humanitarian ideals. 'Knowledge as an instrument' opens up new opportunities to create a holistic picture of the world in which 'knowledge as description' is reflected. The former cannot be automatically assimilated. Nor can it be just passed on by the teacher to an inactive student, for it is generated by the student himself/herself as a result of his/her inner creative activity. It is the product of evolution and self-orderliness of the human intelligence. The teacher's role is to awaken the student's intellect, and to show him/her models of holistic thinking.

Unlike traditional teaching, education aims to master 'knowledge as an instrument' and form a holistic picture of the world, thereby shaping the versatile mind to respond adequately to the non-classical complexity of the world. It is this type of knowledge that will enable an individual to perceive himself/herself as an integral part of the environment, responsible for his/her harmonious relationship with nature and to appreciate science as a tool to achieve such harmony. The new educational paradigm can consequently be defined as a logically connected triad: 'from a holistic world to holistic knowledge, and via it to a holistic personality.'

The new educational paradigm reflects, in my view, certain important requirements of human civilization on the threshold of the 21st century. Successful development of democracy and market economy, attainment of a certain harmony among an individual, society and nature appear feasible on the basis of broad fundamental and integral education, that will enable people to cope

with constant change throughout their lifetime. Advancement of general standards of education, and the elimination of narrowly focused psychological principles so often applied to education, may help society achieve more stability, foster greater tolerance in relations between people, and ensure genuine freedom of thought and action enjoyed by an individual.

## Towards Fundamental Knowledge

Among the priorities associated with implementation of the new educational paradigm I would single out those related to the 'fundamentalization' of education. These important issues, in my opinion, could be divided into two main groups.

The first group of issues refers to the global and indigenous problems in the development of human civilization. It may be relevant to consider the fact that in the process of development, an individual, society, the world community, and civilization as a whole reveal their essential, or fundamental, qualities and features. In this context, it is important to set up an educational system, supported by a relevant structure, that could help identify, follow up and introduce to students the most recent scientific developments that address those fundamental qualities. Moreover, students' attention should be drawn to the most essential, fundamental, stable and lasting knowledge that lies at the core of the currently available scientific picture of the world. This includes the world of outer space, the world of a human beings and society, and the world of human civilization, as well as fundamental global processes unfolding therein.

There is, however, another group of reasons pointing to the need to 'fundamentalize' education. It is derived from an understanding, increasingly shared by the world community, of the priority of personality in the educational system. In line with modern thinking, to nurture a broadly educated personality a number of interconnected tasks should be solved. First, it is crucial to harmonize the individual's relations with nature by helping him/her obtain a scientific picture of the world and knowledge of factors influencing the biosphere and the universe as a whole; understand the place of the human being in his/her natural environment and on this basis approach environmental problems and, on a broader plane, those of the 'noosphere.' Secondly, it is important not to lose sight of the social nature of human beings, and therefore harmonious socialization should be accompanied by cultural assimilation, through the study of history, literature, art, law, philosophy, and economics. Thirdly, modern people live in a densely saturated information environment. So the task facing the educational system is to teach them 'to navigate' in it, and to create the prerequisites and conditions for continuous self-education. And, last but not least, it is necessary that an individual should achieve a sort of inner balance, or harmony. This uneasy task may be facilitated, among other things, by a certain body of knowledge in psychology and physiology, and through deeper acquaintance with literature and arts. Thus, the task of both solving the global problems of humankind and meeting the vital needs of an individual points to the idea of fundamental education.

The following question would be relevant: What lies at the basis of the 'fundamentalization' of education? Apparently, the emphasis is on fundamental sciences. However, before we get to the issue of fundamental education, it appears necessary first to develop an integral perspective on fundamental sciences per se. The fragmentation and differentiation of sciences in the 20th century have reached a point where specialists working in different areas of what used to be a unified field of science no longer understand one another. It should be conceded however that more recently integrational and interdisciplinary approaches have been playing a more prominent role. And yet they are not very common. So, the task of scientists and educationalists is to identify the integrity of each of the fundamental sciences, then try and reveal the integrity of the

natural science as a whole with the entire body of humanitarian knowledge and, finally, at the next stage, to synthesize the principles of integral fundamental education.

One of the key tasks of this new stage of educational development is overcoming the traditional alienation of the natural sciences from the humanities. The two culture components should enrich each other to ease the search for establishing holistic culture at the new stage of civilization development. I believe that at the core of this new type of holistic knowledge there is a specific historical era which has brought it to life in all its unity. Russian philosopher G. Fedotov said:

> *School loses its effect and a book is devoid of meaning in the absence of culture. Being the structural basis of the human mind, culture is composed of a multitude of otherwise disconnected elements. Neither a single element per se, nor the sum total of these elements makes up culture. Literacy and all noble and useful knowledge in history, literature and mythology lie dormant… they remain worthless, unless a miraculous revival of genuine culture takes place.*

The new knowledge being conceived, it is here that the complex interaction between the global phenomena engendered by world civilization and the centuries-old cultural traditions of each nation takes place. The departing century has clearly shown that in the great history of times and peoples there is neither small culture nor small nation; only together will they constitute the supreme value of world civilization and the basis for the sustainable development of the world community. Scientific knowledge as a constituent element of culture comprises objective data of the world, whereby a human being possessing cognitive power acts as a collective explorer of its laws. Consequently, science can be identified with culture as the content of the former and as the reflection and source of a human being's potential to use his knowledge of the universe via education. On the other hand, it is necessary to point out that cultural milieu is moulded and reproduced by people who are not just trained but educated. A personality comes to life and evolves as a result of these interactions.

Apparently, the specifics of the new educational system should also be expressed in the fact that this system must be capable not only of equipping the student with knowledge but also, in view of the steady and rapid growth of knowledge in our era, of shaping the demand for continuous independent assimilation of this knowledge, for learning the skills and habits of self-education, and of developing an independent and creative approach to knowledge throughout the individual's active period of life. Education should ultimately become such a social institution, which would offer the individual various sets of educational services encouraging on-going learning, thus securing for most people the possibility of post-university and additional education. For this purpose, it is necessary to diversify the structure of educational programmes according to the student's aptitudes, and to construct the educational trajectory best suited to his/her educational and professional abilities. It should not be forgotten that the process of cognition must give people the joy of acquiring a new understanding of the world, the purport of life, and their own place in life. It follows that of the major educational problems of the late 20th and early 21st century, the key is finding a relevant organisational structure of the educational system and its institutions, which would secure transition from the principle of 'education for life' to the principle of 'education throughout life.'

Finally, securing the perception of the modern scientific picture of the world requires educational innovation in the most important matter: the content of education and its structure. I would compare the content of the present-day education with Ariadne's clue that may lead us out of the labyrinth of demands and pressures of everyday life.

The new socio-economic situation also makes it possible to find a new resolution of the eternal controversy over basic education and vocational training. The emphasis laid on training students in particular specialties reflects the level of understanding of social security in the previous decades. Today the situation is different. Specific knowledge and narrow professionalism as products of quality education leading to success in life tend to give way to broader development of an individual's creative potential. As the notion of development based on the predominant use of an individual's abilities to do physical work is being supplanted by that relying on the use of the individual's cultural and intellectual potential, education is gaining pre-eminence. Social security can be guaranteed only to a comprehensively educated person, capable of doing different jobs in order to meet the requirements of the latest technologies and the market. Specificity of the new educational system should consist in its ability not only to transfer knowledge to the student, but to enable this student to keep abreast with new ideas and discoveries, and foster his/her ingenuity through self-education.

## Why Does Education Need Information and Communication Technologies?

When discussing educational innovations for the development of society and its economy in the 21st century, we should recognize that they are hardly achievable without effective utilisation of new information and communication technologies. State-of-the-art information technologies enable their successful application in education and allow the creative potential of the student to be tapped into. It is these new information technologies that will help us develop an open educational system. The open educational system will bring about dramatic change in the technology of obtaining knowledge, owing to more efficient organization of students' cognitive activities. These changes are effected through the use of computers and their very important didactic characteristic of individualising the classroom work, without disrupting its entirety, via programmed and adaptable curricula.

The age of new information and communication technologies does not eliminate the most difficult problems which the world of education faces now, and which have to be solved irrespective of whether the new technologies are adopted or rejected. One of them, for example, is reconstruction and reorganisation of school space and school time, the management of this space and time, the reorganisation of teacher training, curricula, the content of education, and so on. Nevertheless, training and development, social and professional requirements, globalization of communication, economy, and political projects of building a new society heavily rely on the introduction of information and communication technologies into education. Education is currently confronted with the issue of choice among many readily available technologies, and the challenge of solving different kind of problems that may follow in the wake of the technologies' introduction. The alternative, however, is to chronically lag behind these developments and, in effect, fail to meet the challenges of the 21st century.

Information and communication technologies give all nations a new chance, which they cannot miss. As part of addressing the educational challenges of the 21st century, it is appropriate to define the tasks of education as a system, and the teacher as its main agent. To this end the interaction between the two domains – that of education, and of information and communication technologies – should be specified too, with a view of a thorough revision of the very basis of education. If this task is accomplished, education will regain its capacity for improved and efficient training, thus meeting the real social and economic demands, both current and anticipated, and will enhance the chances of young people for successful social integration.

Future educational systems are going to place a special premium on the study of the latest developments in the area of information technologies and computer science, as well as issues of

the practical application of such developments and prospects of further research. These technologies are instrumental in optimizing (mostly via introduction of computer-aided systems) various information processes that have gained importance in various areas of society's life in the past decades. Thus civilization is gradually moving towards the construction of 'informatization' society, in which not so much material resources, but increasingly, information and scientific knowledge will be the objects and results of work of the majority of employed population.

The rapid development of the informational sphere of society is dramatically altering the structure of work and employment, and producing new occupations and jobs. This effectively changes the requirements of the educational system. Besides, the availability of personal computers and other electronics and telecommunications appliances and systems opens up new possibilities for home-working for a widening spectrum of professions and trades, including academics, writers, journalists and other information workers, as well as people in various business-related occupations and services. New work opportunities are being created for the disabled and retired, as well as people with caring responsibilities, and in particular women. The effect of these new opportunities is considerable, since need for such flexible working arrangements is felt by many people all over the world.

The current high level of information technologies allows their use and application in many routine processes of educational information processing. When applied in conjunction with information technologies, modern educational systems may also take on part of the teacher's responsibilities, for instance, monitoring the students' progress. Modern means of communication spanning the world provide access to computer-aided systems of education, both to an individual student and groups of students almost anywhere in the world. Thus on the basis of corporate telecommunications networks run by educational facilities, dispersed bases of educational technologies have been created which, by utilizing such infrastructure, are made available for distance learning at any place within the educational environment. In fact this helps solve the problem of qualitative change in the information environment of the educational system, as new opportunities are created for providing education to, and upgrading knowledge of, practically every individual, as well as for facilitating the development and accumulation of aggregate public knowledge.

Creation and expansion of a common interactive information milieu has always been, and still is, an important and effective condition of progress in any society. From a historical perspective, common information environments have contributed significantly to the acceleration in humanity's development, and represented a decisive factor in improving most spheres of human activity (physical, spiritual, professional, cultural, and others). Exchange of knowledge, joint efforts to advance our understanding of nature, as well as the development of science, technology and culture continue to contribute to the task of improving the quality of human existence. Therefore, creation of a universal interactive information milieu may be considered a strategic target for the introduction of modern and future information technologies in all spheres of human activity.

Through application of new information technologies in education humankind seeks to effectively resolve some long-term problems, and thus respond to the challenges of the 21st century by achieving:

- greater effectiveness and higher quality of the educational process;
- intensification of research at educational facilities;
- reduction of time and improvement of conditions for additional education and adult education;

- extension of operational abilities and effectiveness of management at specific educational facilities and the educational system in general;
- integration of national information educational systems into the world network that will considerably facilitate access to international information resources in the sphere of education, science and culture.

It should be noted, however, that wide-ranging and intensive application of technologies in education might entail certain negative effects. Therefore, research into possible psychological and physical side-effects of educational use of information technologies should continue alongside the development of technologies themselves. Additional health care provisions to cover both physical and mental health of students must be carefully considered and put into effect.

## Interfacing National Policy and Global Tendencies in the Use of Information and Communication Technologies in Education

Presently we are witnessing tremendous efforts on behalf of most governments to modernise their countries' educational systems on the basis of information and communication technologies, perceived as key to such a modernisation. Some countries consider technologies to be a vital component in upgrading the quality of education through changes in curricula, introduction of training in new skills and wider scope of knowledge. In other countries information technologies are utilised mainly to ease access to education for various groups of the population, or used for a narrower purpose of facilitating self-education through programmes broadcast via radio and television. Still other countries emphasise reliance on technologies as a means of transforming the educational environment or satisfying specific needs of different categories of students.

No matter which aspect of the use of information and communication technologies is currently more prominent in this or that country, it appears that on the whole, most national plans to introduce information technologies in the educational system would have:

- to take into consideration specific national economic, social, and cultural conditions;
- to borrow from similar plans and experience of other countries (particularly those with a comparable economic and social framework);
- to ensure a fit between the desired scale of introduction of information technologies in education and available technical, financial, and human resources;
- to develop comprehensive action plans for various levels and agents within the educational system;
- to take into account the consequences of the information and communication technologies application and use as they could be experienced by various categories of students, educators, the educational system and society as a whole.

It is becoming increasingly apparent that those who determine educational policy should develop a better perception and understanding of the new realities that, on the one hand, spring from the vigorous growth of information technologies, and, on the other, are dictated by social needs. In this context the questions to ask are: What is the potential of new technologies in solving common human problems and can these technologies co-exist with national and cultural variations?

These questions are coming to the fore as a global information community emerges. I believe it is reasonable to maintain that a successful and balanced development of this global community can

be ensured only if this community is built on solidarity and respect for human dignity, serves common interests, and is a product of united efforts of all nations and social groups.

For such a global information community to become a reality, effective mechanisms of information exchange should be developed to inhibit erosion of national and cultural identity. In as much as not only technological but, more importantly, cultural aspects of providing educational services and products through new technologies become an issue of serious concern, one may consider drafting a Programme of Information Ecology. Such a programme could offer protection for the cultural diversity of the world, similar to programmes on environmental protection that aim to sustain the biological diversity of life on Earth.

## New Literacy for Information Society

In spite of the fact that at the turn of the century literacy for all – children, youth and adults – is still an unaccomplished goal and an ever-moving target, all of us should concentrate on the next steps towards creating an information society. New social demands and the new world around us shaped by the new information technologies and models of action, call for 'New Literacy for an Information Society.' As a substitute for the old meaning of basic literacy (reading, writing and arithmetic), new ones may be presented as finding information by searching written sources, observing, collecting, recording, communicating in hypermedia and involving all types of information and media; designing objects and actions; creating hypermedia essays on the basis of all types of information technologies.

The great saga of human knowledge contains pages that are unique, and I would first list among them those which contain examples combining the potentials of the human mind and technology. The invention of printing raised the institutions of general education to a previously unattainable height. It was the first and perhaps the highest ever stage in the information revolution. But I presume that it will not be an exaggeration to contend that, considering the amazing standards and prospects of application offered by information and communication technologies in education, we are on the threshold of the next stage of the educational revolution, which will entail a dramatic shift in all spheres of human existence.

With respect to this issue I would like to remark that a transition to cyberspace shifts some basic educational reference points: from the linear to a matrix presentation of information, from live mathematics to image-bearing, semiotic and linguistic mathematics, to mathematics of thinking and communication. Parallel to education as a means of preparing students for life, cyberspace is developing as an alternative educational milieu. The basic works of Vygotsky, Piaget and Bruner gave rise to the term 'interiorization' of physical objects, which suggests the creation of 'psychic' equivalents of the latter as 'conceptual' models to be further used to construct variants of our own internal reality or virtual realities. Cyberspace prompts a reverse process, which could be called 'exteriorization,' whereby models of the physical world are conjured up in the human mind and then let out into cyberspace.

Thus we should proceed on the understanding that it is necessary to develop in an individual a very special perception of his or her habitat, which would comprise both objects of the physical world and the ideas of these objects in the human mind, as well as the system of ideas in information space. It is the most interesting and mysterious interaction that is going on between the psychic space and cyberspace. I would like to add in this respect that computer technologies facilitate educational opportunities and assist an individual in perfecting his perceptions. Computer technologies have become instrumental in the rapidly developing art of filming the world's masterpieces, thus making them available to millions of people throughout the world.

Colourful pictures of works of architecture, sculptures and paintings, grouped thematically and accompanied by cleverly made up texts and beautiful music make a strong emotional impact on the student, develop his/her artistic taste and at the same time enable the student to learn more about culture, arts and the history of mankind. These circumstances demand in principal new pedagogical approaches, taking into account that the new information technologies are better suited for adapting didactic to the mode of thinking which operates by association, rather than via direct and consecutive notions.

In order to exploit effectively those opportunities, such new fields as computer psychology, computer didactics and computer ethics shall be better explored and employed by educationists. On the other hand, already at this stage developers of new and promising information and communication technologies shall be oriented towards the practical application of the results, focusing not only on their technical possibilities, but also on broader cultural, educational and ethical goals.

## Ethical, Legal and Moral Issues

Already the initial appearance of information and communication technologies in educational settings has urged specialists to comment on the ethical, legal and moral norms of applying such technologies to learning. Their attention was focused on value-charged computer systems, on the role of computer technologies in imposing certain values upon the oblivious recipient, and on the need to develop reflective attitudes to the values translated by means of computer technologies. Interest in ethical issues has increased to a considerable extent due to the Internet, since the global nature of the Web not only opens up new and exciting opportunities for the generation and dissemination of knowledge, but also increases the danger of conflict between values and standards espoused by different cultures.

In the decades to come, many more people will get access to the Internet. They will go online to search for or offer information, to shop and pay, to advertise products and services, exchange thoughts and express themselves politically or artistically, to convince others, deliberate and entertain themselves. The Internet offers wonderful opportunities to reach out to our fellow human being, but the darker side of human nature finds its way into cyberspace too. It will not take very long before the full spectrum of reprehensible or outright debased moral behaviour is represented online: aggression, violence, crime, deception, brutality, rudeness, and so on. Before the turn of the millennium, we have already witnessed the first signs of cyber-warfare, cyber-terrorism, identity theft, and so on.

The Internet breaks the territorial borders of nation states, and makes geographical boundaries as delineations of jurisdictions inadequate. The Internet constitutes a truly international and global realm of action, where it is practically impossible to successfully impose national laws and regulations.

Another question in moral thinking about the Internet relates to the need to twist and stretch the traditional concept that we are accustomed to using when thinking about information and communication technologies. Practically orienting ourselves in this domain, we easily use such new expressions as cyberspace, virtual reality, virtual community and information privacy, as if we were already clear about the meaning of ‘space,’ ‘reality,’ ‘virtual,’ ‘communication’ and ‘community.’ The use of expressions that have the prefixes ‘cyber,’ ‘virtual’ and ‘informational’ suggests that we know what we understand by them. But this is misleading, since in fact their function is to indicate that we want to talk about ‘a new sort of community,’ ‘a new sort of space’ and ‘a new sort of reality,’ thus taking out a mortgage on future reflection about the nature of

those new phenomena. But at the same time the evaluation of individual action on the Internet departs from evaluations of real world action. So there are some problems concerning our knowledge about the moral status of what one is doing online, what the consequences of one's actions are, given the interdependencies in networks and the concurrent actions in a casually non-transparent network environment. Individuals may simply be unable to predict consequences of their individual actions. That is why specialists in different fields of application of the Internet more and more urgently focus their attention on the following general problems: jurisdiction and protection, application, individualisation and, certainly, moral ignorance.

So, communication technologies based on the Internet, tele-networks and intellectual computer systems open up new opportunities for both teachers and students. At the same time, the amalgamation of these networks and systems makes up the basis of 'infosphere'- the planet's new thinking and infrastructure.

The infosphere envelops the whole of civilization and fills its every pore. It also shapes its own, rather exclusive, world and a community of the initiated. The makers of the infosphere share a new way of thinking, new ethical norms, and a transformed culture of understanding. The advance of infosphere makes us face the phenomenon of super-biological and, probably, super-psychological change in a human being. The computer and information technologies do not merely enhance intellect, they designate new dimensions of the human mind. Live communication, inseparable from information technologies, binds these dimensions together to produce an orderly system of the new culture.

## Learning without Frontiers

State-of-the-art of information and communication technologies allow us to consider practical implementation of the principle 'Learning without Frontiers.' In my view, there are two main obstacles that we have to overcome in order to create educational space without frontiers: geography, and varying capacity of transmitting and perceiving the same information by different people, particularly those with special needs.

The present level of development of information and communication technologies provides a realistic basis for creating a global system of distance learning, which will help overcome the first barrier of space and time in the 21st century. Regardless of the physical distance, new information technologies ensure the kind of direct communication between the teacher and the student, which has always been a characteristic of full-time education, as well as its undeniable advantage. In future the development of distance education will result in the set-up of so-called electronic distributive libraries and universities as a basis for a single educational space serving the world community.

The explosion in information and communication technologies is one aspect of globalization affecting all countries. Policy-makers at various levels and across a range of sectors, including education, believe that new technologies can make a significant contribution to solving all kinds of pressing problems, both in social and economic areas. This in many ways explains the fact that distance learning is being increasingly recognized and adopted in many countries as an effective method of raising the overall educational level of their population; of providing training and development opportunities for employees; or as a way of addressing particularly adverse economic, social or demographic situations.

It is worth mentioning that development of distance learning has been closely following the evolution of the means of mass communication. Today distance education is going through a new

phase, employing new information and communication technologies. The upward trend in numbers of students who combine work and studies is supported by rapid development and wide-ranging application of various electronic means that enable high quality distance learning. They include personal computers, advanced multimedia appliances, satellite communication systems, educational facilities, including cable television, readily available telephone lines, including cell phones, and global and regional networks.

At present there have been many theories of distance learning advanced. I would propose that most of them need revised conceptualisation of didactic, psychological and methodological principles of constructing the educational process. Development of distance learning has a special meaning for those people who, due to various reasons, are unable to obtain education through standard methods. It is of particular significance for people with special needs. New information technologies, as well as a human-created artificial intellectual environment, have the capacity to, at least partially, return to many people the kind of abilities and communication possibilities that they may have been deprived of by nature, environmental disasters, military conflicts, or human violence.

I am confident that this is a two-way street, since after demolishing the barriers of inter-human communication, so called 'ordinary people' will be able to obtain a broader impression of the essence of a human being and of the surrounding world. This seems to be the major humane tendency related to the use of information and communication technologies in education and other spheres of practical and cultural activities.

## Education for the 21st Century

The large scope of the processes taking place in information and communication technologies at the turn of the century, and their growing role in shaping the image of the present and future of humankind, lead us to search for similar examples in the century that is ending. Looking back and assessing the achievements of the present century, I shall venture to single out one very important thing: the concept of relativity laid down by Albert Einstein, Sigmund Freud and Karl Marx in the material, emotional and social worlds. Their brilliant insights gave humankind the possibility of realizing that the world is not what it appears to be, that we cannot trust the empirical perception of concepts of space and time, of good and evil, law and justice, and the nature of human behaviour in society. They gave back to people awareness of the fact that concepts and laws reflect not only the objective reality of the material world, but also the social world. Unfortunately, the past year has given us many examples of how these fundamental truths have been overlooked, causing irreparable harm to nature, the world of living things and humankind per se.

At the dawn of the third millennium humanity is striving to avoid previous mistakes and errors, and learning via education, science and culture to ensure the necessary conditions for sustainable development in the coming 21st century.

## What Should We Expect from Education in the 21st Century?

The World Education Forum, held by UNESCO in Dakar last April, largely defined the contours of education for the 21st century. Education for the 21st century is called upon to be education for all. As our civilization advances further, people without education are ousted beyond the limit of living conditions worthy of human beings. Therefore, infringement of the right to education, as well as a lack of quality education, lead to intellectual and cultural degradation of personality which is incompatible with sustainable development.

Education for the 21st century has to have the ethical dominant at the core of its meaning. It is not just a matter of educating the new generation in the spirit of peace, mutual understanding and tolerance. I believe that on the threshold of the 21st century, it is equally imperative to embrace ecological education and, moreover, try to imbue an individual with global ethics and awareness of global responsibility as standards of a new principle of humanism, for a new united world.

Education for the 21st century is called upon to have a creative and innovative character. In the world where change has become a feature not only of scientific and technological progress, but also of the way of life of the masses, schools and universities must pass on to the new generations knowledge accumulated earlier, and prepare them to solve problems the individual and society have never confronted before.

Education for the 21st century has to be built on scientifically substantiated knowledge. Only on this condition will it be possible to form a personality possessing knowledge and capable of theoretical and critical thinking. Where science is subjugated to ideology, manipulative pedagogical technology or narrow pragmatism, education is fraught with serious danger of deformation of human beings, turning him or her into a blind functionary who has practical skills but no ability to think, and is hence irresponsible.

Finally, education for the 21st century has to be multiform, adequate to the cultural and ethnic diversity of humankind, meeting the all-round requirements of social, professional and confessional groups, as well as individual cultural requirements.

I am convinced that education in the 21st century will acquire a global scale and open character, that it will really be 'Education without Frontiers'. So at the closing of the second millennium the words said by Ch. M. Talleyrand more than two hundred years ago acquire a special meaning:

> *Education is a truly special State, the influence of which cannot be defined by single person, and even national authorities are unable to delimit its frontiers: the sphere of its influence is immense, it is infinite…*

Today this reveals to the world its high standards of 'statesmanship,' which is capable of mediating rampant passions and intractable contradictions not by the means of weapons, but intellect.

A new millennium is nearing. How will our civilization meet this new millennium? In an attempt to answer this question I would suggest we remain mindful of the puzzling paradox: the future of humankind is the reflection of their children's present. I would like to hope that our children's present would be such that it will spare us bitter criticism of future generations, and they will not be inclined to echo the uneasy and heart-felt verdict by Albert Camus that, "they could have done so much but dared to do so little."

Awareness of this truth shall motivate and guide us in our efforts to carry out the laborious but rewarding task of educating the new generation – the future of our planet.

# Theme One

*Global Knowledge, Indigenous Knowledge, Information Technologies and Multiple Intelligences: Towards a Learning Society*

## Global Knowledge for a Learning Society

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## Indigenous Knowledge for a Learning Society

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## Newer Technologies for a Learning Society

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# Global Knowledge for a Learning Society

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## Global Knowledge in an Information Technology Age

Globalization is perhaps the most common word in the modern lexicon. This word means that there is strong connectivity among nations, and long gone are the days when what happens in one country is unknown to the rest of the world. For instance, the world still feels the tremor sent by the Hong Kong stock market crunch in 1997 and we, citizens around the world, witness the mayhem at the presidential election of the United States of America almost concurrently with the citizens of America. In many ways, globalization is made possible by rapid developments in computer technology, particularly Information Communication Technology (ICT) and Computer-Mediated Communication (CMC), in the last century. The effect of ICT and CMC is to accelerate the creation and accumulation of global knowledge.

In this paper, global knowledge refers to knowledge that is beyond local and indigenous context. It is cross-cultural, has high generalizability, and tends to be characterized by a diversity in source. As such, global knowledge has to transpire cultural boundaries. Cheng (1998) proposed a knowledge framework comprising of five knowledge domains across five levels. Relevant parts of the framework are reproduced in Table 1, to guide this discussion on global knowledge and education for a learning society.

Cheng's knowledge framework comprises of five knowledge domains, namely; technical and economic; human and social; political; cultural; and educational. In the technical and economic knowledge domain, global knowledge needs to be created for positive international competition, economic cooperation, international trade and earth protection. Global knowledge in this knowledge domain includes technology exchange and sharing of information among nations. The human and social knowledge domain includes; global knowledge for a Global Village and the development of international friendship and exchange; social cooperation across cultures; and achieving the ideal of eliminating national, regional, racial and gender biases. The political knowledge domain refers to global knowledge for contributions to international understanding, common interests and coalition that may ultimately lead to the elimination of international conflicts and world peace.

Table 1. ***Knowledge domain and global knowledge for the domains***

| Knowledge domain | Global knowledge for: |
|---|---|
| Technical and economic | International competition |
| | Economic cooperation |
| | International trade |
| | Technology exchange |
| | Earth protection |
| | Sharing information |
| Human and social | Global village |
| | International friendship |
| | Social cooperation |
| | International exchanges |
| | Elimination of national/regional/racial/gender biases |
| Political | International coalition |
| | International understanding |
| | Peace/against war |
| | Common interests |
| | Elimination of conflicts |
| Cultural | Appreciation of cultural diversity |
| | Cultural acceptance across countries/regions |
| | Development of global culture |
| Educational | Development of globalized education |
| | International education exchanges and cooperation |
| | Education for the whole world |

The cultural knowledge domain refers to global knowledge necessary for the appreciation of cultural diversity and the acceptance of other cultures. Global knowledge in the cultural knowledge domain hopefully will lead to the development of a global culture with values and goals that are embraced by all. The educational knowledge domain includes global knowledge for the development of globalized education, that fosters international education exchange and cooperation.

Within this knowledge framework, knowledge itself takes on new meanings. Whereas in the past universities and academic institutes have been expected to be solely responsible for the production and dissemination of knowledge through research, nowadays there is more and more input from industry and government. Such input can take the form of industry/government setting

up their own Research and Development sections, or contractual agreements between industry/government and academic institutes. This phenomenon is particularly salient in a number of industries, including computer science, materials science and biotechnology, where the range of specialist knowledge required and the scale of production costs incurred for the production, accumulation, deployment and utilization of knowledge, tend to be beyond what one institute, or even one nation, can afford. Knowledge transfer across national boundaries is largely facilitated by the development of information technology. The reconfiguration of knowledge in terms of knowledge characteristics, creation and use is summarised in Table 2.

Table 2. ***A comparison between traditional and new knowledge***

| | **Traditional** | **New** |
|---|---|---|
| Knowledge characteristics | Canonical | Application oriented |
| | Compartmentalised – with well defined categories | Transdisciplinary and heterogeneous |
| | Abstract | Contextualised |
| | Handed down from generation to generation | Transient; has short shelf-life |
| | Text-based; printed media | Screen-based; multi-media |
| | Physical and substantial | Virtual and electronic |
| Knowledge creation/acquisition | Didactic transmission | Constructivist |
| | Usually acquired in confined locations such as schools and universities | Can be created in diverse environments |
| | The driving force takes an industrial or manufacture mode which tends to be local and small scale<br><br>By academics and social elites who may work in isolation or with co-researchers in the same field | Driven by information needs and global market; tends to be large scale<br><br>By strategically networked field workers who commonly work in teams comprising members from different backgrounds |
| | Subject to vigorous peer review and scientific validation | Subject to social accountability and market competitiveness ("Is this production socially acceptable?" "Is it cost effective?") |
| Knowledge use | Not of major concern | Application of knowledge is impetus for its creation |
| | Knowledge begets knowledge. Knowledge is power. | Commodified; Knowledge is a commodity. |

Educators are charged with two parallel developments that are themselves inter-related: globalization of knowledge; and knowledge that takes on new meanings. Both of these developments are shaped by the fast growing IT developments. The question that needs to be addressed is, what role does education have in creating a vision for globalized knowledge and a learning society?

## Multiple Intelligence and Learning Society

New knowledge is transient and highly contextualized. A solution to one problem may not solve the same problem under another context. Given globalization, it is unlikely that the same problem will occur again in the same shape and form. Mere knowledge acquisition is grossly inadequate. The role of education is therefore to prepare the learner for knowledge transfer across cultural contexts and across knowledge domains. In other words, globalization mandates the development of multiple intelligence (Cheng, 2000).

Further, given the speed at which new knowledge is created, no formal academic institute can adequately prepare its students for work. The knowledge gained at schools or universities will soon be outdated. The application orientation of new knowledge, the transient and contextualized nature of knowledge, all imply that in order to contribute to the globalized workforce, each citizen has to be prepared for lifelong learning. That is, globalization mandates each society to be a learning society.

In a learning society, each learner is self-motivated and generates a learning cycle of self-learning and self-evaluation. Learners, teachers and parents are networked to form a learning classroom; classrooms are networked to form a learning school; schools and the community are networked to form a learning society; learning societies are networked across nations.

The role of education then is to develop the attitudes and competencies of individual learners, such that the vision of globalized education and a learning society is realized. The following are key competency areas of global knowledge for students:

- Knowledge management: The identification, sourcing, documentation, storage, retrieval, authentication and application of information from the Internet and other sources.
- Language and communication skills: This includes acquisition of more than one language and the development of good interpersonal and communication skills.
- IT skills: This includes Internet searching skills, electronic communication skills, and the application of multi-media for communication and documentation.
- Lifelong learning skills: As information technology develops at great speed, self-motivation and competencies for self-learning and self-evaluation are mandatory for survival in the IT era.
- History and cultural knowledge: Knowledge of one's own history and culture, and that of other nations, forms the foundation for mutual understanding and cooperation across cultural boundaries.
- Attitude: Genuine respect for knowledge and understanding of inter-cultural differences.

Table 3. ***Global attitude and global competencies to be developed***

| Knowledge domain | Global attitude to be developed | Global competencies to be developed |
|---|---|---|
| Technical and economic | Respect for fairness in international trade | Analytical skills concerning international trade |
| | Readiness for international economic cooperation | Technical and economic skills for international trade |
| | Openness to share professional knowledge | Professional knowledge about international trade |
| | Commitment for earth protection | Knowledge and skills for earth protection |
| Human and social | Global village | In-depth knowledge about other culture and tradition |
| | Commitment to sustaining international friendship | Competencies in using such communication technologies as fax, phone, email, audio- and video-conference;<br>Communication skills |
| | Commitment to international exchanges | Competencies in more than one language |
| | Respect and accept differences arising from national/regional/racial/ religious/gender differences | Awareness of differences between nations, region, race, religion and gender |
| Political | Promote international coalition | Knowledge about conditions leading to sustainable international coalition |
| | Respect different perspective of other nations; readiness to forgive wrong deeds of earlier generations | Understand historical, cultural, political and economic reasons behind different perspective of other nations |
| | Commitment to Peace and guard against war | Knowledge about the history of own and other nations |
| | Commitment to developing common interests with other nations | Knowledge about the needs of own and other nations in order to develop projects of mutual benefits to both nations |
| | Elimination of conflicts | Competencies in conflict resolution |

Table 3. ***Global attitude and global competencies to be developed*** (cont'd)

| | | |
|---|---|---|
| Cultural | Commitment to protection of own indigenous culture | In-depth knowledge about own indigenous culture |
| | Appreciation of cultural diversity | Knowledge about cultural diversity; commonalities and differences of different cultures |
| | Cultural acceptance across countries / regions | Communication skills |
| | Development of global culture | Knowledge of international and internet etiquette |
| Educational | Readiness to take up shared responsibilities in collective learning | Competencies in managing group learning situations |
| | Commitment to global knowledge | Competencies in self-learning and self-evaluation<br>Competencies in knowledge management for the identification, authentication, storage, retrieval, documentation and application of information obtained via electronic means |
| | International education exchanges and cooperation | Competencies in participating in one-to-many and many-to-many exchange via electronic means for education purposes |
| | Commitment to education for the whole world, particularly developing countries | Competencies in providing technological support (such as translation) to support international peers |

Further, teacher and learner need to help manage the four identified drawbacks of globalized education:

- Information instead of knowledge; and knowledge instead of intelligence: Competencies need to be developed in scrutinizing information and internalizing authentic materials into useful knowledge; competencies also need to be developed in the application, adaptation and transfer of knowledge to different contexts.
- Indulgence in virtual world and breakdown of community: Teachers need to help students develop a strong learning community and engender a safe social environment for students to experiment with learning; teachers also need to help students to distinguish between the electronic virtual world and reality.
- Tension between globalization and individualisation: The value of the individual can be diminished within the wave of globalization which tends to involve massive scales of transaction.

- Indigenous culture endangered: Students need to learn about their own indigenous culture and use that as a basis for developing appreciation of other cultures.

If the drawbacks are well managed, globalized education and indigenous education need not be in conflict. In addition, there needs not be any tension between globalization and individualization.

## Conclusion

This paper applies Cheng's (1998) multiple knowledge framework to develop a framework of globalized knowledge and education for a learning society. In addition, the analysis suggests that globalized knowledge is only part of the process. Rather, successful globalized education should be one step beyond - that of extending globalized multiple knowledge to globalized multiple intelligence. That is, globalized education should help shape the development of competent global citizens, who have the technical and economic intelligence, human and social intelligence, political intelligence, cultural intelligence and the educational intelligence, to engage in networked self-learning in order to play a significant role in the new world development.

# Indigenous Knowledge for a Learning Society

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## What is Indigenous Knowledge?

In many cases, the term 'indigenous' is defined as 'local,' 'tribal,' and 'native'. Also, indigenous people are often referred to as distinctive tribes of minority groups, such as the Aboriginal Australians, American Indians, Indicia, and so on. However, the term 'indigenous knowledge' has a broader and more flexible scope of meaning.

According to the Centre for International Earth Science Information Network, indigenous knowledge (IK) is local knowledge unique to a given culture or society. It is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given culture.

In Warren, D.M., and B. Rajasekaran's *Putting Local Knowledge to Good Use*, Lori Ann Thrupp points out that indigenous knowledge systems are adaptive skills of local people, usually derived from many years of experience, that have often been communicated through oral traditions and learned through family members and generations.

## How Important is Indigenous Knowledge?

In the case of Thailand, indigenous knowledge is substituted by the term, 'local wisdom' or 'Thai wisdom, which means the body of knowledge, abilities, and skills of Thai people accumulated through many years of experience, learning, development, and transmission. It has helped solve the problems and contributed to the development of our people's way of life in accordance with changing times and environment.

In the past forty years, however, Thailand's economic and social development has placed an emphasis on industrialization and technology, which depended too much on Western knowledge and know-how. Even worse, such misguided development brought along with it several serious problems such as trade imbalance, urbanization, cultural and environmental destruction, all of which affect the quality of life of the people.

The economic crisis that occurred during the past three years was the outcome of such mistakes, and caused us to reconsider, review and re-evaluate our social and economic development plan. We discovered that we had pursued a Western way of development and entirely neglected our own indigenous or local knowledge, the splendid treasure that has played important roles in building the nation's unity and dignity. Now it is the time that we should turn back to our own philosophy, our own culture, and our own indigenous knowledge which will be referred to as "Thai knowledge" hereafter. Among our Thai knowledge, 'sufficient economy,' a principle introduced by His Majesty the King of Thailand, is highly acknowledged and being implemented nationwide to pave the way for sustainable development.

## Types of Thai Indigenous Knowledge

Research conducted by many public and private institutes indicates that our indigenous or Thai knowledge can be categorized into 10 fields of knowledge, namely agriculture, manufacturing and handicrafts, Thai traditional medicine, natural resources and environment management, community business, community welfare, traditional art, organizational management, language and literature, religion and traditions.

Before Thailand adopted an educational system from the West, we had had our own educational system, which was informal and provided in three institutions; home, temple and palace. Parents taught children about their family occupation, social values and traditions, while monks taught reading, morality and Buddhism. The palace was the place where all kinds of the nation's classical art were developed, preserved and taught.

The distinctive features of indigenous education are, of course, learning by doing, learning through authentic experiences, individualized instruction, and happy learning, all of which are rarely found in the schooling system of education.

## The Recession of Indigenous Knowledge

In retrospect, there are three main reasons why Thai indigenous knowledge has faded away from our Thai way of life. First, it was the system of education that we adopted from the West, which focuses on modern knowledge, such as mathematics, sciences, etc. This system includes professional teachers, who have also been trained by the modern system of teacher training. Second, it was a lack of research and development in the field of indigenous knowledge. Most of the research both in educational and research institutes is conducted in the field of modern science. Third, the status of indigenous knowledge specialists was not recognized when compared to modern knowledge educators.

## The Policy on Thai Indigenous Knowledge

The Office of the National Education Commission (ONEC), as Thailand's national education policy organization, has conducted research on Thai knowledge in order to revitalize and return it to our educational system. We have proposed to the government a national policy on Thai knowledge, establishment of an organization in charge, establishment of Thai knowledge learning centres, remuneration for Thai knowledge teachers, and the government's commitment to support the operation of the learning centres.

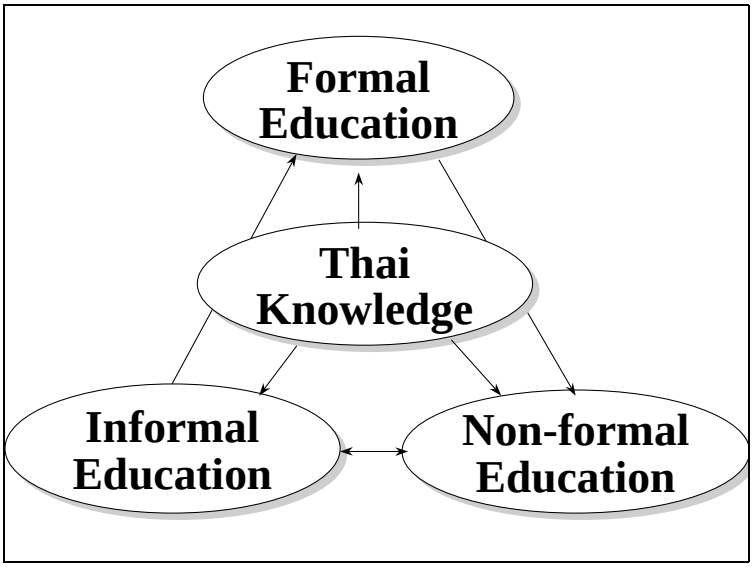
Our research-based policy was accepted by the cabinet, allowing the implementation of the policy through the main strategies as follows:

**Strategy 1:** Establishment of a Thai Knowledge Council, which consists of Thai knowledge specialists, who will decide on matters relating to the curriculum, instruction, and promotion of Thai knowledge.

**Strategy 2:** Establishment of the National Research Institute for Thai knowledge and Education, which will promote research on Thai knowledge.

**Strategy 3:** Establishment of a Thai Knowledge Fund to provide support for research, education and teachers of Thai knowledge.

**Strategy 4:** Promotion of teaching and learning Thai Knowledge in the three systems of education: formal, non-formal, and informal.




**Strategy 5:** Honouring and rewarding Thai Knowledge teachers, who have developed their expertise through informal education or self-learning, so that they will be recognized at the same level as certified school teachers. They will be encouraged to set up their own learning centres to transmit their Thai Knowledge to the young generation in the community.

**Strategy 6:** Formation of the Thai Knowledge Information Network System to collect and disseminate information on Thai knowledge. The network will also be a channel that Thai knowledge learning centres can use to communicate and exchange information through the Internet.

## The Constitution of the Kingdom of Thailand

Fortunately, in 1997 the ONEC had an opportunity to propose the contents of education and culture during the enactment of the new Constitution. With strong support of many segments of the society, Thai knowledge was recognized as an important part of the Constitution, as follows:

**Section 46:** Persons so assembling as to be a traditional community shall have the right to conserve or restore their customs, local knowledge, arts or good culture of their community and of the nation and participate in the management, maintenance, preservation and exploitation of natural resources and the environment in a balanced fashion and persistently as provided by law.

**Section 81:** The state shall promote local knowledge and national arts and culture.

**Section 289:** A local government organization has the duty to conserve local arts, custom, knowledge or good culture.

These prescriptions paved the way for all organizations concerned to revitalize Thai knowledge and utilize it, as a means to strengthen many communities once destroyed by misguided development.

## The National Education Act

To comply with the Constitution, the National Education Act, which was also enacted on a research basis, expands further the roles of Thai knowledge, referred to as Thai wisdom, in the educational system.

**Section 23:** Education through formal, non-formal, and informal approaches shall give emphases to knowledge, morality, learning process, and integration of the knowledge about mathematics, science, languages, vocational skills, conservation and utilization of natural resources and the environment. Most of all, knowledge about religion, art, culture, sports, Thai wisdom, and the application of wisdom is also emphasized.

**Section 24:** In organizing the learning process, educational institutions and agencies concerned shall enable individuals to learn at all times and in all places. Cooperation with parents, guardians, and all parties concerned in the community shall be sought to develop jointly the learners in accord with their potentiality.

**Section 25:** The state shall promote the running and establishment, in sufficient number and with efficient functioning, of all types of lifelong learning sources, namely: public libraries, museums, art galleries, zoological gardens, public parks, botanical gardens, science and technology parks, sport and recreation centres, data bases, and other sources of learning.

**Section 27:** Basic education institutions shall be responsible for prescribing curricular substance relating to needs of the community and the society, local wisdom and attributes of desirable members of the family, community, society, and nation.

**Section 57:** Educational agencies shall mobilize human resources in the community to participate in educational provision by contributing their experience, knowledge, expertise, and local wisdom for educational benefits. Contributions from those who promote and support educational provision shall be duly recognized.

## ONEC's Policy Implementation on Indigenous Knowledge

Realizing that **t**here exist in the community experts of Thai knowledge who have already operated their own learning centres, the National Education Commission has searched, selected, honoured and promoted 30 local knowledge experts as so-called 'Thai knowledge teachers'. They are representatives of diversified areas of local knowledge. These teachers must have accumulated their knowledge and skills for many years and have been recognized for their contribution to the transmission of local knowledge to the communities. After being selected, they are required to organize a programme of teaching Thai knowledge to young people and receive financial support accordingly.

Thai Knowledge Learning Centres can be categorized in three types: Thai Knowledge Learning Units, where an individual knowledge teacher operates his or her own learning centre; Mobile Thai Knowledge Learning Units, where the teachers will move from place to place; and Thai

Knowledge Learning Centres, where Thai knowledge teachers of various fields will take turns in teaching at these rather large-scale centres.

## Some Case Studies of Thai Knowledge Teachers

**Case Study I:** *Promotion of an Organic Agriculture Community*
*Mun Samsi*

Born into a farming family of Yasothorn province in the northeast, Mun Samsi, like many other farmers, received only primary education. Realizing the danger of chemical fertilizers, Mun has developed his expertise in developing organic fertilizers made from decaying plants and animals. Furthermore, he initiated an assembly of villagers to organize community business, a community bank, and a village fund. Some of his famous innovations are the production of toxic-free rice, herbal medicine, and so on.

**Case Study II:** *Srisawalai Khamrangsi*
*Transmission of Weaving Art to Youths*

Born as a rural village girl in Nan province in the north, Srisawalai finished her formal education at primary school. However, she attended non-formal education courses and is now pursuing her bachelor's degree in business management at a nearby community college. Srisawalai was selected by Nan province to attend a training course on vocational development for girls, organized by the Community Development Department. After the training, she showed leadership in organizing a group of young girls to practise weaving by themselves. The group has developed the unique local style and pattern of cloth. Their products extended from plain material to table cloths, scarves and local costumes. They then began using natural dying colours made from tree barks. The number of group members keeps increasing and they are now self-sufficient in terms of economy. It is a genuine learning organization, where members always search for new ideas and innovations to improve the quality of their products. The outcome of her endeavour is that the students in the group have acquired knowledge and skills in weaving, and earned a living to support their families. Most of all, the village can preserve its local culture and wisdom.

**Case Study III:** *Amporn Duangpan*
*The Development of a Community Welfare Fund*

Amporn, born in Songkhla, in the south of Thailand, also had only a primary education background. He used to work as a janitor at a primary school, while running his own rubber and fruit plantation. With his vision and progressive way of thinking, Amporn started a saving group or a so-called community bank, of which villagers are members. He initiated special regulations of the bank and has run the bank carefully for the benefit of all villagers. While the country's economic crisis caused collapses in business at the national level, his community bank has surprisingly accumulated over 80 million baht in savings. He further initiated a welfare system for members, which provides medical fees, wedding facilities, life insurance, and so on, by using the interests generated from running the community bank. His success made him well-known to the public and his idea is now used throughout the country. He is very often invited to transmit his knowledge and experience to other communities.

## Conclusion

Indigenous knowledge or local wisdom enables lifelong learning in society. It not only strengthens the community's economic situation on the basis of self-sufficiency, but also in terms of moral values, and local culture among community people.

In the globalized world, it is certain that most of the content of the Internet will focus on Western knowledge, ideas, and culture. However, if there is nothing done to promote the learning of local knowledge, our future generations will definitely not understand where we are in the world, and perhaps lose the root of their culture.

Education in the globalization age should therefore be the balanced integration between global knowledge and indigenous knowledge. Therefore, modern science and technology must go hand in hand with indigenous or local knowledge for sustainable development in any community, international understanding, and peace and harmony of the world.

# Newer Technologies for a Learning Society

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> ***"Learning can no longer be viewed as a ritual that one engages in during only the early part of one's life…...Information and communication technologies are being used to cross the age, time and space barriers to bring lifelong learning to all" (UNESCO, 20 December 1999)***

People of all ages, at all places and in all different environmental contexts are learning all the time, many purposively updating their knowledge and skills in whatever things they are doing - they comprise the learning society. At the same time, the objectives of education have become more complicated. It is not sufficient anymore to teach a certain body of knowledge and skills. Learners are expected to acquire higher levels of cognitive skills - problem solving, creativity, collaborative learning, synthesis, and above all the skill of how to apply acquired knowledge to new situations and how to learn new knowledge. New information and communication technologies are not only facilitating new ways of learning but also helping present and future workers develop the flexibility to adjust to new demands and the ability to learn new skills required in a fast changing technology-based society and economy. Learners' needs are diverse and the variety of settings they are in requires a diversity of means. Here is where information and communication technologies can provide their valuable contribution. They are flexible, unconstrained by time and place, can be used on demand and provide just-in-time training. They have the potential to offer synchronous and asynchronous learning opportunities.

## The Learning Society - Who Are They in Terms of ICT Use?

The learning society is a mosaic of groups of learners, some found in the formal sector, some in the out-of-school sector, some in the work place or corporate world. They are the youth, the women, the aging population and the marginalized groups.

In the school sector, information technology has revolutionized the field of education by providing new learning environments and new ways to learn from them. More and more countries are equipping schools with ICT to support teaching, for the establishment of School Nets to link schools, and conduct virtual education (distance education) to train teachers as well as to offer an out-of-school alternative to junior secondary education, among others.

In the out-of-school sector, non-formal education and literacy campaigns are being delivered either on-site or through tele-education. Open and distance learning has been used for two main purposes: to offer an out-of-school alternative to junior secondary education and for teacher education.

ICTs are being used to reach farmers with online information and services on agriculture and biotechnology, which is aimed at increasing local understanding of biotechnology and local applications of new technologies; providing a forum for discussion among rural farming

communities through managed bulletin and chat rooms; providing searchable information on agricultural biotechnology; providing access to expert advice and troubleshooting related to agricultural problems; and introducing e-commerce to small and medium scale agricultural industries.

Health care workers are being reached by tele-medicine projects going on in different parts of the world. Tele-medicine services are able to offer an opportunity for training and education, medical information access, health care and support for patients, remote diagnosis and consulting, emergency/epidemic support, preventive care education, and immediate access to medical databases.

Within industrialized countries, Internet-based approaches have been used to meet the educational needs of migrant children. Radio and distance education have been employed for the education of refugees and broadcasting for children in war zones. More and more Multipurpose Community Tele-centres (MCTs) are being set up to reach rural areas and bridge the digital divide. Distance education is being used to connect indigenous tribal groups in the Cook Islands, Marshall Islands and the Indian tribes in the United States, to bridge the cultural divide and provide education in culture and language.

Nowhere is lifelong learning more applicable than in the workplace or corporate world. Lifelong learning is now used as a terminology to describe the internal training being conducted by corporations, factories, and industries to update continuously their staff's employment skills. Almost all of these are using the Internet for delivery, many using distance and virtual education, because its capacity for asynchronous delivery makes it the ideal medium for mobile professionals in global companies, who need 'anywhere, anytime, anyplace' education. These educational courses offer immediate application: 'learn tonight, apply tomorrow.'

Women in developing countries face particularly severe obstacles to access and use of information technologies. Today, more and more women are staking a claim to the information highway and venturing into the digital age. Many examples of experiences around the world have shown that Internet is proving one of the most exciting and accessible mechanisms for the empowerment of women using the new ICT as tools for change in education, socio-economic opportunities, civic and cultural participation and networking.

The greatest social challenge of the 21st century will be the aging of human society. By the year 2025, the number of persons aged 60 and over will increase from today's 590 million to 1.2 billion. Lifelong learning for the 'third age' will be an essential part of the new set of public policies and programmes. Laurence Wolff, in his article entitled, "Lifelong learning for the Third Age," identifies four potential areas of learning which will help the needs of the aged: (1) learning to reduce the human and financial burden of chronic health problems; (2) learning to train the elderly on how to serve their own families as well as take voluntary activities in the community; (3) functional literacy which will help the elderly to increasingly remain in the work force; and (4) learning for self-enrichment and empowerment of the elderly. The Internet, mass media, especially television, but also radio and newspaper, can be powerful tools for the delivery of learning opportunities to the elderly.

## Learning Pipelines

Today's learning pipelines include a combination of the new and modern, and the conventional: satellites, audio or video conferencing, broadcast television, audio or videotape, radio and computer-accessed technologies including intranets, internets and CD-ROMs. Powerful 'virtual

classrooms' are actually a result of the merging of multiple technologies. Virtual collaboration is the process of communicating via the Internet and other web-based tools like e-mail, text and verbal chat, database, bulletin board, etc. To deliver to any person at any place at any time digital curricular materials that integrate information in multiple forms (i.e. audio, video, imagery, simulations and sophisticated tools of analysis and synthesis in addition to traditional text), high-speed networks are used. High-speed networks can unite the library and the classroom, the researchers and the research database, and open the tools and the data of advanced research to curious inquiry by all, creating a rich, high-quality environment of educational resource

These tools and hardware are awesome. But after all is said and done, the issue is not technology per se, but rather how one can or should use technology to create content and learning experiences that are engaging, motivating and lead to successful performance learning outcomes.

A review of experiences in countries already using ICT reveals that there are basically two ways in which they had been or are being used. First, technologies are used to extend or replicate the classroom model and are basically used for tutorial purposes such as drill and practice programmes, tutoring systems, satellite transmission of lectures and canned CD ROMs. The second manner covers those that fundamentally change the instructional paradigm. This involves reconfiguration of time and place for learning, but most importantly new ways of learning by collaborating with other learners and using the multimedia and interactive properties of computer.

In summary, the two types of applications include the first which makes it easier, quicker, or more efficient to teach the same things in the same ways teachers have always taught them, while the second application makes available new and better ways of teaching them.

## Types of Learning Situations and Role of ICT in Each

In 1998, a review team from Tele-Learning Network Inc. conducted a survey of experiences in the use of ICT in learning and teaching. They published their findings in a report entitled "The emerging contribution of online resources and tools to classroom learning and teaching." Their analysis of the use of ICT in education has led them to synthesize the different types into a framework or TCLC (Teacher, Content, Learners, Context) Model of Use, as shown below:

- **Teacher (from transmission to facilitation)** - at one extreme the teacher may be primarily concerned with delivering content information to the learner, while at the other extreme, is facilitating activities of the learner that result in learning.
- **The content (from pre-organized or canned to constructed)** - at one extreme, an already existing body of knowledge is being taught, and at the other extreme, students are investigating and discovering new information.
- **The learner (from limited access to online resources to high access)** - at one extreme, the learner goes to school to access the computer once a week or visits a few sites irregularly, and at the extreme end, each student has a laptop networked to a server which provides internet and intranet connectivity.
- **The context for the use of online resources (from low external support to extensive external support)** - this shows the extent online use is supported by educational leaders capable of mobilizing resources, and bringing together stakeholders who can support classroom activities and experts.

Most current learning situations, both in-school and out-of-school, would lean towards the left end of each continuum: the teacher is still very much a transmitter rather than a facilitator; the

content is pre-organized like a canned CD ROM rather than constructed by the learner; the learners have low access to online resources; and the context offers the teacher limited rather than high support for new initiatives and resources. This situation shows low integration of information and communication technologies.

The ideal situation is where all elements are at the positive side of the right end of each column: the teacher primarily facilitates student learning; the curriculum content is largely constructed by the learners; the learners have free access to online resources; and the context supports the use and expansion of the resources.

## Trends in ICT Use

A review of experiences in ICT use is mostly focused on the school context and takes into account the availability and accessibility of online resources and connectivity in learning. This review outlines trends in ICT use in education, especially dealing with use of online resources as the world gradually becomes more and more connected. These trends are as follows:

- Generally, there is still low integration of ICT in education in an authentic way.
- There is an emergence of a new mixed mode of learning: face-to-face and online learning activities.
- It was found that face-to-face meetings or synchronous interaction in real time are still required to supplement asynchronous and independent learning, if more effective learning is to take place.
- Information and communication technologies have become a driving force in educational reform and form part and parcel of national educational policies and plans. However, many educators who see online technology as an enabler of new teaching, learning and governance practices, may only have at this point scarce information with respect to the potential and authentic use of ICT in education.
- Because ICT and web-based learning offers greater diversity of learning goals, projects, alternative activities and stimulating exercises as compared to the traditional classroom offerings, research has shown that student and teacher interest and motivation has increased substantially and produces more positive reaction to learning and teaching.
- The use of ICT in successful online classrooms has been facilitated by use of appropriate pedagogy, which shows a decrease in teacher-led activities and frontal instruction, and a move toward more project activities and independent learning.
- Online learning demands that learners should have more control of their educational content and activities.
- The availability and accessibility of online learning resources, which can be manipulated or changed online and the content updated, have made the learning situations more realistic and authentic.
- Online learning through the Internet has been shown to provide built-in technical tools which support effective and easy learning.
- What started as a growing tendency towards use of computers in networks to promote group learning activities will accelerate and overrun the individualized approach.
- Universities are now entering into partnerships with the private sector and IT industry, in order to help maintain the operation and financial viability of ICT-based education programmes.

- ICTs are altering the function of university libraries and are intrinsically changing the role of librarians. Schools need not continue to suffer from lack of library support and remain isolated from a wealth of learning resources readily available on the Internet.

## Trends in Tools and Applications

Various kinds of tools and applications have been generated from online and conventional learning. There are those applications for distant learning that are fully web-based, and deliver live, interactive lessons via the Internet or Intranet and promote virtual collaboration (Joseph Slowinski, 1999). Some learning programmes use both the traditional and new technologies presented in a multimedia way. These multimedia offerings usually include the use of learning modules/workbooks, Internet activities and videotape/CD ROM activities. Often the inexpensive, time-honoured approaches (learning modules and videotape) for asynchronous learning are combined with use of the Web for communication with the instructor and other learners during the self-directed portion of the learning, as well as the use of the Web for downloading large technical documents. It also includes use of voice and video networks combined with Internet and CD ROM content, to provide additional interactive distributed learning contents. To facilitate interactivity in learning, there are E-mails which provide asynchronous collaboration tools for tasks like scheduling and participation in online forums or discussion groups; web conferencing and chats to support simple synchronous communication and real-time meeting that can be recorded and preserved for later review. There are also tools for web authoring to create and update contents and files which enable learners to collaborate in group project writing.

## Keys to Success

The uses of ICT in many countries still have their downside**.** A status report on applying new technologies in basic education prepared for the World Education Forum show for example that projects are likely to be at risk if they are at the leading edge of technology. Other experiences, mostly in developed countries, have shown that success in the use of ICT in education is dependent on a number of conditions. These include:

- Interactivity in learning experiences can only be effectively attained if the system uses a high speed network, if the bandwidth is higher, and combines the power of the Internet and reliability of the voice network, coupled with a less expensive small-dish digital video technology as well as dedicated facilities.
- For e-Learning programmes to work, there is a need for sophisticated management systems to coordinate, integrate and manage all the pieces that make up the learning system.
- If technological innovation is to be sustainable, it should be supported from the top, seen as a prerequisite for the country to compete in the new global economy and knowledge-based society, generate a sense of ownership among the stakeholders, and should be placed in an organizational location which allows freedom for the innovator.
- Virtual collaboration and web-based distance education are best suited for certain groups of people, such as those who have an established history of sharing and working together prior to introducing computer-mediated communication tools, people with high skills in word processing, e-mail and web surfing, teachers who use computers mostly for simulations and applications generally associated with higher-order thinking, and those who possess greater self-discipline as web-based distance education requires a lot of independent study.

- Any project which introduces ICT use to its clientele should include a training in IT literacy component into the programme to ensure success in meeting the project objectives. Training should not be limited to the basic use of computers but also more importantly include how to integrate ICT into teaching and curriculum development.
- In terms of content, information that will be taught using online resources becomes acceptable and interactive if it is indigenous to the learners and includes learners' input.
- Community building is difficult in cyberspace since it is an artificial environment. Face-to-face contact with web learners and users is still indispensable for some learning situations.
- Collaborative learning is promoted if ICT makes use of groupware or multi-user software, as many learning softwares are meant for a single user.
- For teachers and students to feel relaxed enough to experiment and explore, as required in an interactive, open style type of Web-based learning, high-stakes examinations should be avoided if possible.
- An advocacy and promotional component should also be included in ICT education in order to encourage more participation.

## The Challenge at Hand and in the Future

It is heartening to note that current times are seeing a gradual dying away of the old view that technology is a 'black box' that promotes 'teacher proof' instruction. Similarly, the tutorial uses of technology (drill and practice programme, tutoring systems, and canned CD ROM lectures or satellite transmission of lectures) are being recognized as ineffective and should be replaced. The future will hopefully see new technology as:

- Widening access to developing countries; through providing alternative ways of access, such as use of mobile units, sharing of computer facilities with other agencies, mediated access where a third party seeks information through computer networks on behalf of a school; use of satellite wireless Web and $200 solar powered downlink/uplink computers to bring access to the remotest villages; and continued combined use of new and traditional/conventional technologies. The main challenge in applying ICTs to education is to find ways and means of achieving potential benefits without widening the gap between information rich and information poor countries.
- Expanding open universities' capabilities to provide lifelong learning opportunities for all; especially supporting instruction that is more graphic, audio-oriented, engaging, and up-to-date, especially for courses meant for low literates (Robert Savukinas, 1999).
- Meriting investment as a cost effective way of raising educational quality of training teachers and extension agents because of its multiplier effect.
- Being combined with conventional learning technologies (use of broadcasting such as radio and television, text-based communication, audio, video and CD ROM) as well as face-to-face interactions especially meant for certain learning situations and for those just starting to use new technologies in education. The hybrid approach will continue as current Internet bandwidth and access speeds are still inadequate for the delivery of multimedia instruction.
- Gradually substituting current and old practices where the same practice drill still occur in learning, using new technologies with actual integration of ICT into activities that are a core part of the classroom or learning curriculum.
- Supporting student performance of an authentic task and used as a tool to help accomplish a complex task rather than merely gaining knowledge about a subject.

- Encouraging collaborative learning to replace the individualized approach.
- Contributing to new roles for students and teachers and the professionalization of teachers, thus improving quality of teaching and training.

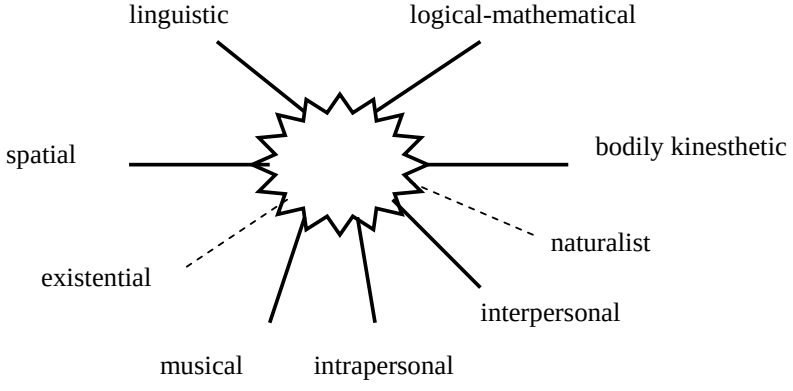
However, it should be noted that good practices around the world suggest a cautious approach to the introduction of computers in the schools or for the learning society. Pilot and small scale programmes should be experimented on first, in order for the education authorities to accumulate experiences in an area universally recognized as highly demanding in technical, managerial and human resources without incurring massive expenses in launching large programmes and the risks of premature commitment to technologies.

# Multiple Intelligences for a Learning Society

*Pilar Habito*
*President, Cahbriba Alternative School Foundation, The Philippines*

***"Have you ever imagined how a society of 79 million people, with 31% in poverty and 60% children and youth being rediscovered - can unleash the power hidden for three centuries of colonial darkness? In the beginning was the Word. Knowledge like the value of Sunrise to life. Man created in wisdom and understanding of a powerful image of life that shines with love. A human being is a biological miracle in this once-in forever celestial event makes an individual different in this world. We have the power of choice that is the very essence of humanity."***

One dimensional views of intelligence have hampered other hidden potentials from creating a higher quality of life and equal opportunity for all. The theory of Multiple Intelligence diverges from the Intelligence Quotient point of view. IQ is measured by the ability to answer items on test of intelligence. Here intelligence is seen as a boxed-in attribute, that does not change much with age or experience. Instead intelligence is defined as the bio-psychological ability to solve problems or to fashion products, that are valued in one or more cultural or community settings.




There are nine intelligences located in the human brain, each of which has equal claim to priority. They are:

- Linguistic – the talent for speech, debate and the like.
- Logical-mathematical – the talent for numbers, analysis and problem solving.
- Spatial – the ability to form a mental mode of a spatial world and to be able to manoeuvre and operate using that model.
- Musical – the talent for the configuration of sounds.
- Bodily-kinesthetic – the ability to solve problems or to fashion products using one's whole body or parts of the body.

- Interpersonal – the ability to understand other people, what motivates them, how they work, how to work cooperatively with them.
- Intrapersonal – the capacity to form an accurate, veridical model of oneself and to be able to use that model to operate effectively in life.
- Existential – the proclivity to pose questions on existence.
- Natural – the ability to observe flora and fauna, their patterns and characteristics.

Howard Gardner's Project Zero (1972-1992) inspires us to discover the nine intelligences of man and related lines of professional work.

***The nine intelligences of man and related lines of professional work***

| Intelligence | Applicable lines of professional work |
|---|---|
| Spatial | Architecture, astronomy, painting, photography, sculpture, filmmaking |
| Bodily-kinesthetic | Dance, magic, entertainment, boxing, gymnastics, billiards, basketball, golf |
| Musical | Singing, guitar playing, composing, recording, stage production |
| Logical-mathematical | Mathematics, engineering, chemistry, computer science, statistics, risk management |
| Linguistic | Fiction, poetry, teaching, interpretation, advertising, ghostwriting |
| Interpersonal | Ambassadorship, salesmanship, marketing, management, counseling |
| Intrapersonal | Psychiatry, psychology, brain/mind research |
| Naturalistic | Ecology, biology, entomology, pest management, livestock breeding and selection |
| Existential | Philosophy, astronomy, bio-engineering |

## The Wonders of MI as a Learning Paradigm

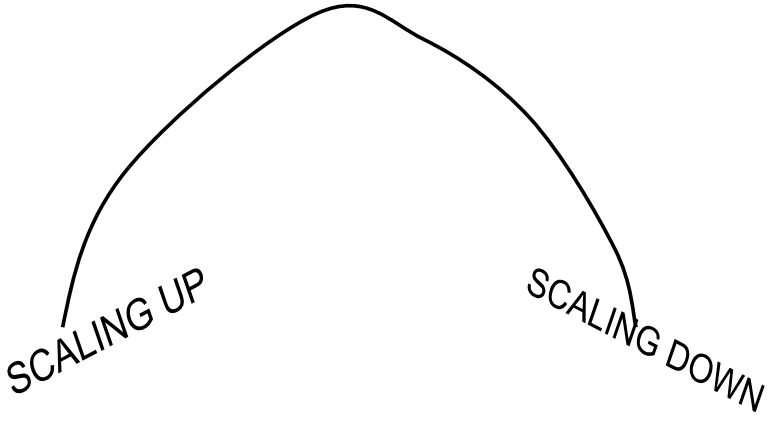
> ***Knowing that there is no direct tie between a scientific theory and a set of educational moves allows man the opportunity to be free to explore and implement any number of educational approaches. In an art like teaching, and in the joy of learning, the proof of success comes down to whether an approach works, it matters little whether the theory was correct (Gardner, 2000).***

Education is not confined only to formal settings, such as a school or academy, but in the genius of multi-media technology within home, community and work settings. In an educational landscape, inquiries promote new knowledge and performances in different contexts and across cultures and varying time frames. There has now arisen greater interest in human cognition. Neuroscience reveals the mind to be multifaceted and multi-component, and thus cannot legitimately be captured only through paper-and-pencil standardized tests. The human nervous system is highly differentiated and affirms the different learning styles of individuals. All normal

human beings have all seven potentials. But due to bio-psychological factors, individuals differ in intellectual profiles that are exhibited at any particular moment of life. It is crucial for an individual to know one's intelligences or proclivities so that such strengths can help one to choose opportunities of learning according to learning style.

## No Quick Fix

What began as an apprenticeship on Project Zero (1979-1980) with my son as a direct beneficiary at Martin Luther School, Cambridge, Massachusetts, served as a springboard to venture into a journey that seems bottomless. The establishment of an alternative school called Cahbriba (Garden of Love) allowed as the opportunity to go "deeper into multiple intelligences." Through a naturally evolving process of change and eventually after 13 years of continuous total transformation of mind, heart and hand, we share with you MI in a learning society.




## Scaling Up

We first had to have an organizational vision that would ensure total quality of education for all. It spells PEACE - People Engaged in Active Community Experience. Scaling up this mountain to PEACE required thirteen years devoted to articulating a programme that is naturally evolving to be systematic, thorough and reflective. It entails reforms in thinking and doing, in pursuit of a manageable number of perspectives toward the attainment of good, quality education. This individual centred education will succeed if we actively integrate assessment, curriculum, teacher education and professional development and community participation.

Inspired by Gardner's MI, the challenge is to create pedagogical and curricular synapses that propel the use of technology and the curiosity of children in deepening understanding. We used three helpful ingredients shared by Howard Gardner:

- Clearly articulated programme – detailed vision of the child's experience with teachers and parents as facilitators and partners of change in school and community life.
- Consistently held focus – students' works and performances are assessed as milestones, consistently networking with the natural context of home and community its own-shared accomplishments.

- Conviction – one is engaged in an active experience or a communal fight against cultural mindsets that hold captive the creativity and freedom God gave as a choice for mankind.

Gaining an initial foothold in a learning school community meant further scaling up considerations as follows:

- Importance of leadership
- Need for long term perspective
- Need for flexibility and small victories
- Allow time for reflection
- Pay attention to implicit messaged in the institutional culture
- Cultivate new energies
- Visit and be united
- Commitment to change

This meant total quality management of school governance and improvements in curriculum, people, resources and accountability frameworks.

## Scaling Down

In all these entry points, sharing accountability over the improvement in education of our learners provided an opportunity to build stronger lateral relationships as teachers, students, managers and parents. The contextualized learning environment enhanced a deeper appreciation of our culture and ecology. There are at least seven powerful entry points to diverse concepts and understanding:

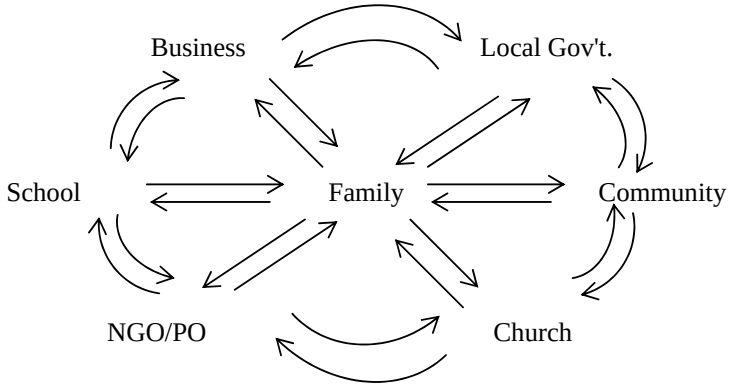
***Seven entry points to understanding***

| | |
|---|---|
| Narrative | Effectively involves a large number of learners through drama and vivid prose. People love stories, that through generations, activate linguistic and personal intelligences. Mime or theatre engages other intelligences as well. This can further expand to history of nations and individuals. |
| Numerical | Studies of quantitative orientation and modelling to data analysis and programmes. |
| Logical | Related to, but distinct from, mathematical symbols is a preoccupation with logical propositions, their interrelation and their implications. There are causes and consequences to actions that emanate from relationships and environmental factors. There is logic within musical composition, as in Miss Saigon. |
| Existential/ Foundational | Deep inquiry of the mind about existence, meaning of life, the crisis of human greed, love and hate. The historical account of the holocaust. |
| Aesthetic | Balance, organization, shades and features of colour coordination provide other mediums of interest in music, literary works and dance. |
| Hands on | With children spontaneously exploring with their senses and physical materials as in breeding of flies in biology. |
| Interpersonal | Learning happens in cooperation with others like debate, role-playing and experimentation of physical and biological phenomenon. |

## Bottom Line of Success: MI in a Learning Continuum Society

The bottom line is to create opportunities for a community of learners, in a community that cares, is responsible and knowledgeable. Again this means strategic planning with multi-stakeholders within the bigger community of PEACE.

**PEACE: People Engaged in Active Community Experience**




There will constantly be new mountains to climb and three virtues become focal points of celebration – TRUTH, BEAUTY and GOOD. It is a fact that creativity and goodness are not necessary limited, but as building blocks in a society we can strive to connect these virtues. This PEACE Model has chosen the children as key entry points to ensuring sustainable development. This is where our future lies

Gardner again shares a plausible set of six multiple pathways any society can choose from:

- Canon Pathway
- Multicultural Pathway
- Progressive Pathway
- Technological Pathway
- Socially Responsible Pathway
- Understanding Pathway

An eclectic pathway has been chosen to unite us as a people in a multi-cultural environment. We are attempting to mould responsible children. We want to develop not only the Mind but also the Hands and the Heart, to mould a complete person, a total person. You can easily connect Hands, Mind and Heart with Truth, Beauty and Goodness.

In addition to the family, members of the community must be working hand-in-hand with the school staff in active support of the instruction of children. In law, basic education has been decentralized to the local government in the Philippines. In fact, that has not happened yet. We are working towards that.

Sometimes we dream that government officials and the private sector are able to see governance in the eyes of a child, in simple, honest, multiple perspectives. If nothing else, this is the revolution that MI is fighting for. With MI, we are trying to mould our children so that each one of them can become a positive force for change. For we believe that a culture that would not allow children to be trained to become a leading force toward change, deprives further generations of opportunities for more meaningful change. Our national hero said it best: "The Youth are the beautiful hope of the fatherland".

Under a Memorandum of Agreement with the National Economic and Development Authority (NEDA), the Department of Education and Culture, and the Canadian International Development Aid (CIDA), the Multiple Intelligences Paradigm of Learning and Teaching becomes a means to unleash the power of Filipinos to be radically renewed in mind, heart and spirit. With wealth in our youth, community and nature we will find our national identity and continue to become responsible in our international citizenship**. *Y3K: Yamang Kabataan, Komunidad at Kalikasan*** is an indigenous knowledge which becomes our contribution to the search for wisdom in our global community. Where unity begins, God completes his Master Plan. To all, PEACE and *Mabuhay*!

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# Theme Two

*Interfacing Global and Indigenous Knowledge in Educational Content and Teacher Education*

## Interfacing Global and Indigenous Knowledge for Improved Learning

*Konai Helu Thaman*
*Professor of Pacific Education and Culture, Fiji*

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## Interfacing Global and Indigenous Knowledge in the Curriculum

*Paul Hughes*
*Yunggorendi First Nations Centre for Higher Education and Research, Australia*

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## Interfacing Global and Indigenous Knowledge in Evaluation and Assessment

*Michael A. Mel*
*University of Goroka, Papua New Guinea*

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## Shaping the Curriculum: Contexts and Cultures

*Professor Paul Morris*
*Hong Kong Institute of Education, Hong Kong*

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# Interfacing Global and Indigenous Knowledge for Improved Learning

*Konai Helu Thaman*
*Professor of Pacific Education and Culture*

For my purposes, education is defined as an introduction to worthwhile learning. I also distinguish between formal education (organized, institutionalized learning such as in schools and colleges), non-formal education (organized but not institutionalized learning), and informal education (unorganized, non-institutionalized learning). Indigenous education is mainly informal and non-formal.

If education is about worthwhile learning then it is about culture, since the content of education has value underpinning it, associated with a particular culture, which I define as a way of life, and includes particular ways of knowing, knowledge and wisdom, as well as ways of communicating these. Lawton (1974) defines curriculum as a selection of the best of a culture, the transmission of which is so important that it is entrusted to specially prepared people-teachers. However, we know that in many countries, formal education continues to be Euro-centric in outlook and academic in orientation, reflecting Western industrial and scientific cultures, rather than the cultures of learners and as well as teachers. This trend is further fuelled today by the rush to globalize education and sell it in the global market-place.

In most countries, we know that access to the sites of power, whether it be law, media or education, lies with privileged groups. In developed countries, they are usually male, white and middle class. In developing countries, they are usually male, middle class and Western educated. While the phenomenon has been challenged (although not changed) in developed countries, it has not been challenged in developing countries, where formal education continues to be culturally undemocratic and does not recognize the way the majority of learners communicate, think and learn. In Oceania, where the quality of both primary and secondary education is deteriorating, this is the rule rather than the exception.

Students' underachievement in schooling has been attributed to 'cultural gaps' between the expectations of the school curriculum and those of the cultures in which students are socialized. In Oceania this gap also exists for the majority of teachers. This raises the question of whose and/or what knowledge is considered worthwhile? Furthermore, the current euphoria for market driven economies and educational development also makes issues such as cross cultural transfer, globalized curricula and appropriate learning strategies worthy of urgent, critical consideration. The urgency arises from the fact that globalization is blurring cultural diversity (considered important by the international community) and educational services are becoming increasingly standardized and homogenized.

The question of who is an indigenous person is partly addressed in the United Nation's definition of indigenous people as "first peoples who are minorities in their own lands." This is too narrow a definition as it would leave out most people in Oceania, and I want to include them in this discussion.

Given this broader definition, we would agree that there exist in the world today many vibrant indigenous cultures, many of which are in the Asia-Pacific region. The special rights and needs

of indigenous peoples have been recognized and are reflected in various regional and international instruments, such as the United Nations Decade for Culture, the Draft Declaration of the Rights of Indigenous Peoples, the Decade of the Worlds' Indigenous Peoples (Towards a New Partnership), the Commission for Indigenous Education, the International Research Centre for Indigenous and Maori Education, and many others.

In the context of this panel's theme, we may want to contemplate questions such as:

- How much of indigenous ways of knowing and knowledge still exist, and will this knowledge cease to exist when elders pass on?
- What impact does schooling have on indigenous notions of education and educational processes, and is it possible to create new philosophies and frameworks that are culturally inclusive and therefore more meaningful to both learners and teachers?
- Who should control the production and transmission of indigenous knowledge?
- How can indigenous knowledge be used to benefit learning and learners?

For thousands of years, Oceania cultures have had their own education systems, long before schools were introduced by European colonialists and missionaries less than 200 years ago. The introduction of schooling meant that students faced the conflicting demands of schooling and those of their home cultures, because the purpose, content, and processes of schooling conflicted with those of indigenous education. Furthermore schooling de-emphasized the very values that underpinned indigenous education, leading Goldsmith (1993) to declare that "there was no better way of destroying a society than by undermining its education system."

At a UNESCO sponsored seminar held in the Cook Islands in 1992, participants from Pacific Island Nations (PIN), as well as representatives of the indigenous peoples of Australia and New Zealand, affirmed their desire to ensure that schooling in general, and the curriculum in particular, recognize and value the cultural milieu in which children are socialized. Disregard for this would further hinder their ability to benefit from schooling or develop positive cultural identities. It was also agreed that elements of Pacific indigenous cultures should be incorporated into the school curriculum. The seminar also acknowledged that there exists huge cultural gaps between the culture of formal education and those of the majority of school students, a factor that is increasingly being seen as a major contributor to teaching and learning difficulties.

Since 1992, efforts have been made in many PINs to incorporate elements of local cultures in the school curriculum, as well as the curriculum of higher education institutions – particularly those responsible for teacher education. The initiatives came mainly from indigenous teacher educators, who realized the need to incorporate more culturally meaningful content in the curriculum of teacher education. UNESCO has actively encouraged and supported these, and in 1997 the UNESCO Chair in Teacher Education and Culture was established at the regional University of the South Pacific (USP), and a major teacher education curriculum research project was launched.

Targeting teacher educators is an important part of our effort to include indigenous knowledge and ways of thinking in the curriculum of higher education. Since we believe that it is the teacher who will have to bridge the cultural gaps in students' learning, through improved contextualization of curriculum and instruction, the USP's Institute of Education in association with the UNESCO Chair, has begun publishing a series of Teacher Education Modules (Towards Cultural Democracy in Teacher Education) aimed at helping teaching staff in regional colleges and universities, to better contextualize their work.

My contribution to this movement has been mainly through my own work as a teacher, researcher and consultant, and as an advocate for the de-colonization of the school curriculum and pedagogy, through more critical reflection of what schools are actually offering students. I have also contributed (through my poetry) towards a body of (Pacific) literature to which students can relate. Through my work as a teacher educator I hope to influence students (who will eventually become teachers) to do the same in their work.

The balance of this presentation is a brief description of how I try to bring about cultural inclusivity in one of the courses I teach at our university. ED253: Educational Theories and Ideas was a course about the development of Western educational thought. When I was asked to take over five years ago, I reconceptualized it, and included an exploration of indigenous and vernacular educational ideas before a study of various educational theories through a study of selected educational thinkers. Using a conceptual framework which I used to study Tongan educational ideas (Thaman, 1988), the students, almost all of whom are from PINs, analyse their own vernacular culture's educational ideas and compare them with those of the Western thinkers studied in the course. Analysing their vernacular educational ideas, the students perform four basic tasks: i) examining the word in which the idea is expressed; ii) examining how the word in used in different contexts; iii) determining whether the meaning is educational or non-educational; and iv) determining what the meaning implies or presupposes.

In my study of Tongan education, I identified three basic educational ideas: *ako, ilo* and *poto*. *Ako* is used to denote learning as well as searching, and in the early part of last century it was also used to mean teaching. Later when schools were introduced, the term *faiako* (making learning) was used to refer to a school teacher. *Ilo* denotes knowing, knowledge and information and implies learning and/or searching. *Poto* refers to one who is wise or learned and is used to describe a state of being or kind, and implies the use of *ilo* for the benefit of the group and wider society. Before schools were introduced to Tonga in the early part of the 19th century, *poto* was simply knowing what to do and doing it well. Later it was reconceptualized to include the achievement of schooling. Today a person is *poto* if she/he uses *ilo* gained through *ako* for the benefit of one's group. Although the meaning of *poto* has changed, the value underpinning learning, cultural survival and continuity, remains. As one teacher told me during an interview, "*Ko e ha e 'aonga 'o ha mata'itohi 'o kapau 'e 'ikai ha 'aonga ki he famili kae'uma'a e fonua?*" (What is the use of a degree if one is not useful to one's family and country?).

The work that my students have carried out on their own vernacular education (as far as I know these have been the first such studies on this topic) have shown some interesting similarities, as well as differences, among Pacific (indigenous) cultures. For example, Levi (1995) reported that in Samoan culture learning is said to take place when the learner or *tangata 'aonga* acquires something of value which would enable him/her to function outside his or her own personal limits, and uses the same term *poto* to refer to someone who uses *iloa* (knowledge) in a beneficial way. Similarly, in Tuvaluan society a person is said to be *poto* if she/he is not only skilful and knowledgeable but can command the respect of the wider community.

And in indigenous Fijian culture, a concept similar to *poto* is *yalovuku,* which is considered to be the culmination of *vuli* (learning) a process which involves the acquisition of knowledge and skills or *kila ka* (Capell, 1957; Nabete, 1997). An associated concept is *yalomatua,* a state of being which is said to reflect maturity of spirit and sacredness of being (Nabobo 1994). Among the Lengo people of Solomon Islands a wise person is *manaath* if she/he through a lifelong process known as *nanau* (learning) acquires important knowledge and skills or *ligana* regarded as necessary for survival in Lengo society (Vatamana, 1997). And in Kiribati there are different levels of knowing and knowledge ranging from *atatai* (common knowledge) with which all people are expected to be familiar, to *wanawana* the highest level of knowing and knowledge

which presupposes proper and beneficial use of other types of knowledge, including the ability to conserve and diligently use available resources. (Teweiariki, 1997).

The process as well as the achievement of learning as described above occur within a context of shared (cultural) values by people who belong and identify with a particular (Pacific) culture. In order to understand these concepts and their meanings one has to understand the values that underpin them. For example, in Tonga I identified certain (ideal) value emphases which most people use to justify their behaviour and to explain the behaviour of others. Because these tend to preoccupy people's thinking, I called them "valued contexts of thinking". They include considerations of; spirituality and the supernatural, rank and authority, kinship and interpersonal relationships, restraint and context specific behaviour, and others (which denotes love and respect for all). Work carried out by my students indicates that these are also important in other indigenous cultures.

As well as individual assignments and tests, cooperative teaching, learning and assessment are utilized through the structure and processes of tutorials which require students to attend. Group members (about 6-7 in a group) take turns to chair, moderate and summarize the results of discussions based on the week's theme. Lectures are given by myself and other staff as well as people from the community who provide case studies of indigenous/vernacular education systems for comparative purposes.

The success rate is high (85-90 per cent pass) and feedback from students is positive and encouraging. Many say that the course was the first they experienced where their own (cultural) knowledge and experience were valued and recognized and formed an important part of the curriculum. They also valued the opportunity to theorize their own education and to develop their own personal philosophy of teaching and learning. But changing curriculum content, in my view, is not enough and a new philosophy of teaching and learning is needed. I share with students my own philosophy of education, developed after much critical reflection (Thaman, 1992). *Kakala* is my personal philosophy and provides me with a framework for teaching, research and curriculum development that is rooted in my culture.

*Kakala* is Tongan for fragrant flowers and leaves, which are woven together and worn in special occasions, or presented to a special guest as a sign of *'ofa* (love) and *faka'apa'apa* (respect). There exists a special mythology and etiquette associated with *kakala*. The making of *kakala* involves three different processes; *toli, tui* and *luva.* Toli involves the picking of different flowers required for making the *kakala*; flowers are ranked depending on their cultural importance. The type of *kakala* made depends on the occasion, and/or who is expected to wear it. Tui is the process of making or weaving the *kakala*, the time taken to make a *kakala* depends on the nature and complexity of the *kakala*. In Tonga, not everyone is adept in making the most beautiful *kakala*. Knowledge and practice are important. Finally, *luva*, the giving away of the *kakala* to the wearer, who may be a dancer, a special guest or someone leaving on a long trip. *Luva* is important because *kakala* symbolizes important values for sharing; the receiver is expected to pass on his/her *kakala* to someone else. For me and the students that I teach at the USP, *kakala* provides an educational philosophy and methodology that are rooted in our own (Pacific) cultures (most Pacific cultures have equivalent notions), and can be adapted for different learning settings. *Kakala* requires us to utilize knowledge from foreign (global) sources as well as from our own indigenous cultures, in order to weave something that is meaningful and culturally appropriate for those under our care (learners).

I know that in an increasingly globalized, technological, borderless, and polarized world, teachers have been relegated to the back of the schoolroom to "facilitate" learning and allow modern students to take charge of their own learning, whether this involves going to a library or

downloading globalized information from the World Wide Web. But I believe that teachers have never been more important to the educational process than they are today. Most of the world's children do not have access to the internet, and many more will never have the opportunity to learn to read and write. It is important that when they are required to learn, the content and processes of learning are better contextualized and culturally appropriate and meaningful for them. Although efforts to do this exist already in innovative schools, similar efforts are too few in higher education. The example I have provided plus others from around the world are contained in a recent publication *Local Knowledge and Wisdom in Higher Education* (Rhea and Teasdale, 2000), where authors show how indigenous and local knowledge and wisdom can, and does, make a difference to learning in schools and universities throughout the world.

For indigenous peoples themselves, their systems of knowledge creation and transmission are worthy of study in their own right, and must be part of what is worthwhile to learn in schools. This is important too for the conservation of cultural diversity. However, I believe that indigenous peoples must have control over their own knowledge and its transmission. Therefore there is a need for collaboration and partnerships between educational institutions and indigenous peoples, particularly in areas where the control of schools is in the hands of non-indigenous people. Finally I believe that indigenous knowledge and values provide a useful alternative to the total framework of Western, scientific, and reductionist thinking, which continues to dominate education in Oceania, and which I believe contributes to many learning difficulties faced by students as well as teachers today.

# Interfacing Global and Indigenous Knowledge in the Curriculum

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In this paper, I will be discussing the above as it applies in schools using my own country, Australia, as the nation under consideration, and my own indigenous peoples, Aborigines, as the subjects of the action.

## Its Place in the Life of a Nation

Article 26 of the United Nations Universal Declaration of Human Rights states in its section ii:

> *Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.*

Indigenous groups across the world have argued for many years that the inclusion of indigenous perspectives and knowledge in and across the curricula would substantially assist in achieving the aims of the above declaration.

At the 1999 World Indigenous Peoples' Conference on Education, Hilo, Hawaii, the "Coolangatta Statement'' on indigenous peoples' rights in education was accepted. The statement represents the collective voice of indigenous peoples from around the world who support fundamental principles considered vital to achieving such reforms and transformation of education for indigenous peoples, their nations and the world.

The above statement speaks to the inherent rights of indigenous peoples, as declared in the above Article and most particularly in Article 27 of the United Nations International Covenant on Civil and Political Rights, for indigenous People to be included in the education processes of their nation state.

Although Indigenous Studies has been viewed in the past as a discrete curriculum area, I believe that its inclusion across and in all curriculum areas can have a major impact on a nation, through parents and children's attitudes to the school and its classrooms.

In Australia, and I know in other countries too, indigenous people are greatly concerned about a school's intentions for indigenous students and their cultures. We feel that teachers display an ambivalence about us that can be damaging to our students' self esteem and our home culture.

I believe that it is time for us to move forward and push for integrating indigenous knowledge into as many of the curriculum areas as we can. If my country is to become a reconciled nation then it is necessary for Aboriginal matters to be part of what people come into contact with ordinarily, rather than in extraordinary ways via politics or the media. We need indigenous lifestyles, values and knowledge presented in curricular as a part of the Australian way of life and learning.

I am often asked how I can reasonably justify asking schools and teachers to introduce aboriginal perspectives and knowledge to any great extent in the school curriculum? The people who ask this usually go on to back up their statement with points such as; Australian indigenous people are only 2 per cent of our population. There are many other minority groups – why not them too?; We already integrate multi-cultural studies into everything – that should cover it; It encourages resentment if you just do Indigenous Studies and not the others; Schools already have an over-crowded curriculum, and so on.

People can expand on their arguments of justification and I can appreciate that an argument can be made on any of them. However, the Aboriginal education movement would argue its case – as I do – on the simple basis of the following:

Indigenous people are the original inhabitants of the country. For that reason alone we deserve a place in the life of the nation. But more than this, Australia will never be a full nation until its indigenous peoples are naturally included on a daily basis as Australians.

At the second GARMA Festival held in Gulkula, Australia, in September, 2000, indigenous Australian scholars gathered and made the following statement:

> *Indigenous philosophies of life and their connection to country, and the knowledge, languages and spiritualities derived from this, are the foundations to historical and intellectual traditions that have been in place since time immemorial. As cornerstones to Aboriginal peoples across the nation, and our futures in a globally changing environment, it is important that these principles are embedded in our lifelong education and embraced by non-indigenous peoples.*

Indigenous perspectives and knowledge can contribute specifically to all children's understanding about the history and nature of our Australian society – both indigenous and non-indigenous, as the opportunity comes up in daily lessons.

It is a sad thing to say but racism is pervasive in Australian society – or to be kind pervasive ethnocentric attitudes of racial deficit are an inherited norm. I have no doubt that this is also the case in many other countries too – especially in those who have been 'invaded' by another culture. In the case of indigenous people in Australia, we have been dispossessed, culturally denied and denigrated by racism since the time of colonization. I will admit that our people are not the only ethnic group subjected to this, but we are the original, and to date the most seriously affected by it.

I would argue that by including indigenous perspectives and knowledge in a classroom curriculum, teachers will be able to enhance indigenous students' self esteem, plus give all children awareness of the history of contact in Australia, and respect for indigenous culture as a valid part of our country.

## A Rationale for Teachers

It is generally true in all countries that the nation and its teachers have not been brought up with any real knowledge about their indigenous peoples. The starting point has to be an understanding of how indigenous knowledge can intersect with the school curricula. In Australia we have done some detailed work on this during 1994 and 1995. The South Australian Education Department's Aboriginal Education Unit co-ordinated an Australian Government funded production of

”Incorporating Aboriginal Perspectives Across the Curriculum.” It is a training and resource package for teachers taking up the challenge to incorporate indigenous perspectives in all learning areas. For the first time in Australian education, teachers and schools were directed towards the inclusion of indigenous perspectives across their curriculum.

By including indigenous perspectives across curriculum areas, students and teachers have an opportunity to broaden and deepen their understandings of indigenous cultures and ways of being. As our country moves into the 21st century and stumbles towards reconciliation it is today’s students who will take up the challenge of ensuring that our society values indigenous peoples and their cultures alongside those of all Australian peoples and cultures. In this way our country can take its place as a whole nation, inclusive of all the knowledge’s of its citizens.

All the information I will now present for teachers as a rationale and starting points for the following curriculum areas has been prepared in consultation with indigenous people, classroom teachers and other curriculum staff from South Australia. I take no credit for what follows, as I have taken it from the “Incorporating Aboriginal Perspectives Across the Curriculum” publication, paraphrasing its information for the purposes of this conference paper.

I present the information as it might apply to the following four curriculum areas with a comment on two others.

## English

Traditional indigenous groups had a very sophisticated understanding of the role of narrative and poetry in human life. Through story and song they taught the law and lore of their groups, relating the spiritual and the material, the poetic and the prosaic, moving easily between the symbolic and the literal, in a manner which integrated all aspects of human experience.

Many contemporary indigenous people are expressing the same understandings by embracing written language in poetry, prose, drama and song as well as electronic communication through film, video, radio and integrated multi-media on CD-ROMs. Thus there is a significant point of connection between the learning area ‘English’ and indigenous cultures, both past and present.

There are increasingly numerous resources available now to make it easier to include indigenous perspectives in the English learning area. Learning can focus on similarities and differences between indigenous cultures and the many other Australian cultural groups, and other indigenous cultures throughout the world.

Resources are available in oral forms, in print, on film and audio tape, and range from traditional aspects of culture through to experimental, satellite television and novels set in the future.

## Mathematics

Few non-indigenous Australians today understand, or appreciate, the extent that traditional indigenous cultures incorporated mathematical concepts, and much in fact is not known. Traditional indigenous mathematical thinking is both similar to, and different from, Western concepts with more value generally on ‘place in space’ and ‘abstract space,’ and quality rather than quantity. Generally there is a much closer link between the development of a mathematical construct and its social significance than in Western thought.

Learning about indigenous mathematical concepts will allow students an alternative view of the world, reflecting their own countries' unique cultural heritage and see Western mathematical concepts in a more global context. The aims of including indigenous perspectives in the mathematics area of study can be summarized as being:

- To value similarities and differences between Western and indigenous mathematical concepts.
- To recognize the various ways in which contemporary indigenous people continue to use traditional cultural concepts related to mathematics.

## The Arts

This area allows for numerous opportunities to incorporate indigenous perspectives within the curricula in exciting, dynamic and informative ways. Traditionally indigenous arts were not separate from everyday life and everyone contributed. Ceremonial life, song, dance, body painting, decoration and story telling were linked with both the spiritual and material aspects of life. History, law and environmental information were conveyed through ceremonies and art and are still done so today. Opportunities for including indigenous perspectives clearly include dance, drama, media, music and the visual arts.

## Science

Western science is only one expression of scientific endeavour and it already incorporates Arabic, ancient and Soviet explorations of the world, as well as contemporary European. It can also legitimately incorporate indigenous explorations of the world, as it is not fixed and must remain flexible.

Any science teacher aims to teach:

- Scientific thinking and processes
- Particular content in the form of current data and theories of the material world
- An openness to alternative explanations of material phenomena.

Indigenous scientific thought provides some similar and some different theories about the material world, derived from processes which parallel Western scientific thought but which operates within a different framework. Therefore it sometimes comes to different conclusions. Indigenous practices of producing, for example, clay pots requires a precise knowledge of the physical properties of raw materials, the source of, extraction etc. A detailed knowledge of fire was also required. Such knowledge was not just happened upon. Similarly indigenous groups did not just instantly know about the qualities, properties and habits of edible beasts, plants and other useable resources. Also, the tools required to obtain such foods and medicines did not just happen. Indigenous groups had to work all of this out, and their scientific endeavours were recorded in song, symbol, story, dance and every day practices.

Every aspect of the earth and the stars, energy and change, plus time, life and living was integral to daily indigenous life. If explored by science teachers, they provide a great range of alternative views of scientific thought and endeavour from groups that have survived for many thousands of years.

## Other Areas

Indigenous perspectives are most usually put in the area of Studies of Society, and often as the only area for inclusion. I mention it in this paper simply to say that indigenous perspectives do deserve a particular place in this teaching area – and such studies do fit well and ordinarily, but as I have been describing above, it should not necessarily be the only place. Similarly indigenous languages offer a rich area for inclusion, if only for the study of place names, local geography, and the inclusion of indigenous words in daily use. I offer this very personal view that interfacing indigenous knowledge in the curriculum is useful to a nation, and in turn, to our globe in terms of advancing the understanding, tolerance and friendship among all nations.

## Reference

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# Interfacing Global and Indigenous Knowledge in Evaluation and Assessment

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Classrooms in Papua New Guinea (PNG) support the view that all knowledge is technically objective and value free. All knowledge is viewed as independent of human beings. All levels of education in PNG have been structured and exist within this perspective. Assessment and evaluation as concepts, and their application, confirm these beliefs and become the boundary setters between the individual self and the outside world of knowledge. In PNG this worldview has gradually created problems for many of our young people who have been educated. Notions of being a failure, a dropout and not being good enough have developed and perpetuated a climate of disillusionment. Assessment and evaluation under this worldview have contributed a large portion to this climate.

There is now a strong need for change. This change is not about changing the tools of assessment and evaluation. Band-aid approaches will only maintain or even make matters worse. What is needed is a shift in mind set, a change in worldviews in regards to what is education. In turn this will enable examination of the system or culture of assessment and evaluation.

My paper outlines an indigenous perspective regarding knowledge and the individual that is being developed at the University of Goroka. In this context the basic view is that each individual has the capacity to see, experience and produce knowledge. From this perspective, knowledge is not an entity that is outside. Knowledge is a personal process, as it is social. The production and acquisition of skills and knowledge are acquired through participating and experiencing education. Teaching and learning are collaborative activities between teacher and students. This paper provides new windows for defining and actualizing assessment and evaluation.

## Introduction

There is a commonly held belief, which was developed in the West many ages ago, which says that there are two sides to being a human being. On one side there is the human being or individual person. On the other side of the coin if you like, is the world that surrounds the individual. I as a person can say that there is an 'in here' and an 'out there.' This sense of the out there and in here have also been arbitrarily divided into the objective and the subjective. Sometimes these have been determined as the material and the spiritual or the conscious and the unconscious. Mel (1996) cites Lakoff and Johnson (1980) to express this view of the Western self succinctly:

> *We express ourselves as entities, separate from the world – as containers with an inside and an outside. We also experience many things, through sight and touch, as having distinct boundaries, and, when things have not distinct boundaries, we often project boundaries upon them – conceptualizing them as entities and often as containers.*

How do we bridge this supposed divide in the human being? Put another way, how do we come to see and make sense of the world? It is common knowledge that language has been accepted as the natural and neutral medium that connects what is outside in the world to the individual. Objective reality is represented and made sense of through language. The individual viewed as an entity, totally independent of the world, uses language to reveal truths about the world.

## Education as out There into in Here

If you can allow me to take this thumbnail perspective of what is a complex maze of ideas that has been thrust globally, there are two points I would like to raise for this conference and with reference to my sub-theme. Firstly, I would like us to look at the processes of teaching and learning from the perspective of the learner. From the perspective of the worldview I briefly developed a moment ago, for a learner there is the 'in here' and then there is the 'out there.' What is around the learner, the out there, are considered facts or knowledge that are value free. Education has been seen and understood as a process for the learner to digest, bring to the in here, that knowledge. Secondly, I would like to suggest we see how the teacher fits into the scheme of things. The teacher has been as having the responsibility of enabling the learner to digest the knowledge out there. For most people a teacher is an expert (or shall we say trickster) who devises ways and means to deliver the out there to the in here of the learner.

Modern education in PNG, and around the world, has been conceived and structured around these two perspectives of the learner and the teacher. All the processes and practices that deal with education, for example, the curriculum, teaching methodology, classrooms, desks, timetables, lesson plans, roll books, blackboards and so on, contribute toward the actualization of the perspectives. Among these practices we must not forget assessment and evaluation. Assessment and evaluation are considered important activities by teachers, learners and all persons interested in the education process, and determine the success or failure of the processes of teaching and learning. Tests, quizzes, exams, and even the ubiquitous question are demarcation tools if you like of the out there and the in here. Moreover these value free and therefore neutral demarcation tools determine the level of success attained by the learner in the process of being educated, that is, bringing the out there into in here.

In PNG such processes in education have contributed to a whole host of problems. Growing numbers of young people have become disillusioned because education seems to have been incapable of delivering what it promised – a future comprised of further training, a job, a regular income, and a better life. There is a global image of disillusionment. Basically the Western worldview has worked with the assumption that since we are human beings we should think and feel the same the world over. There has been very little consideration given to local knowledge.

Consider the phrase 'determining the level of success': what does this really mean? Quiet simple, I dare say success in bringing the out there into in here and this depends on ideas like 'ability,' 'IQ,' 'cleverness,' and 'brightness' that relate to the learner. But who determines notions like ability? In asking these questions, what do we mean by ability, clever, and bright? If we can briefly relate to the point I mentioned earlier about language, that it is a neutral medium to describe truths about what is out there, we use these terms to determine the state of how things are (call it mental capacity, natural ability) in learners. But, is there a state of being clever? Who is bright or lacking ability? Are they tangibles? In other words, are these states of being in that out there? If we continue in that vein of question is there an out there that is apart from an in here?

## The Local over the Global

We cannot continue to advocate the global perspective. I believe that, and here I borrow from information technology – a system that operates at a global level, while we human beings may have the same hardware, we have different software. The software is crucial in determining what we see and how we know the world.

In this paper I am advocating for the local over the global. In order to find answers to the questions I asked above we need examine some local or indigenous worldviews and determine how we comprehend reality and the human subject. In these contexts the conception of an out there and an in here as two separate entities is challenged. T he human being is not an independent being, who uses a neutral language to reveal the world. In my own context of the Mogei people in the Highlands in PNG there is no distinctive separation between an out there and an in there. Allow me to provide a very brief perspective of this worldview. The human being is referred to as *Iamb* and the world (environment, cosmos, people both above and dead) as *Kola*. *Iamb* talks to *Kola* through language (oral, visual). *Kola* also talks to the *Iamb*. This provides a tension. But this tension is not about tensions of temperament or violence. It is a tension related to finding a meaningful existence. Each *Iamb* is unique in that it has *Noman*. *Noman* relates to thinking, feeling and knowing. *Iamb* through *Noman* constructs a meaningful existence through language, referred to as *Ing*. Through *Ing* the *Iamb* imposes her meaning on *Kola*. Similarly *Kola* makes every effort to impose meaning. The meaningful tension to existence is referred to as *Mbu Iamb*, living within the made sense world of *Mbu Kola*. Both *Mbu Iamb* and *Mbu Kola* are not locatable entities, but processors that constitute the individual, and as the individual constitutes the world. The implications for education with such a worldview in the relationship between the in here and out there is that knowledge is created by the individual. Language is not a neutral medium that reveals truths about the world, but is used by individuals to impose meaning and make a meaningfully constituted world off *Mbu Kola/Mbu Iamb*.

From this perspective terms like ability, bright, clever, even IQ are now contentious because they are not referring to value free states. From a teacher's point of view, and indeed for those who subscribe to these terms as 'natural states,' we would be imposing our own meaning onto other people's (learners') performance and value those over others. Tests, exams and quizzes instituted in the process of education would be about confirming and conforming a particular interest, a specific status quo. Foucault's (1972) notion of discourse as "practices that systematically form the objects of which they speak" makes a useful contribution in this perspective. Harrison (1991) develops further this point by asking, "what if these were rather the self-perpetuating obsessions of the regarding eye than the immanent properties of the objects under consideration?"

Assessment and evaluation practices that have dominated the educational landscape of PNG raise ideological issues regarding students and their performances in classrooms. Teachers have had a hegemonic effect on the student's efforts. The student has been denied any capacity to determine and develop her own knowledge because her efforts been interpreted through the teachers' eyes.

It is my belief that change is needed to give recognition to the student's efforts in seeing and making sense of the world. Moreover in indigenous contexts, like that of the Mogei, the learner is recognized as having the capacity to make decisions and gradually learn to contribute meaningfully to the community. In PNG there has been a strong shift in this direction since the publication of "The Matane Report" (1986). One of the fundamental shifts in the document was towards the recognition and enunciation of indigenous ways of seeing and knowing by all those involved in the enculturation project in PNG.

## New Directions in Assessment and Evaluation

In the remainder of this paper I would like to share with you some ways in which I am working to develop a teacher education programme at the University of Goroka that is based on an indigenous perspective. I had the opportunity to discuss the project and its initial development in a recent publication. I would like to share with you what I am working on developing and implementing next year with regards to assessment. Since this is a work in progress, it will be more about ideas and how these have been embedded in the indigenous context.

## Recognizing the Learner and Prior Experiences

In indigenous communities assessment and evaluation did occur, but it was in the same way that individual learners are scrutinized and singled out individually and as a cohort. Since learning is an activity driven by the individual, assessment is really a focus on the individual. In my project each learner is acknowledged as a participant, with a vast array of experiences prior to coming to university. These experiences provide a strong foundation to further these experiences and develop new ones. Each learner is allowed to join in the group, and during the course time will be made available for each learner to share past experiences that helped to shape their lives. This is a formal way of recognizing previous experiences and sharing with others, because learning in the indigenous context is a social process of dialogue and engagement with others.

## Teacher as Nurturer

The teacher in the indigenous community was a parent, relative, next of kin and an experienced and skilled person in activities and making decisions on matters that affected her and/or the community. The relationship that person had with the learner was intimate. Intimacy in this sense means a high level of personal interest in the quality time spent with the learner, and the development of trust and love for values the community held in high regard. The relationship was considered most important. In the programme, the development of the relationship between learner and teacher is valued highly. This is fostered by each teacher taking a interest in the lives lived by learners both in and beyond the classroom. Informal meetings and chats are developed where both teacher and learner can spend time sharing experiences. The teacher advises and provides a sounding board for the learner to check ideas and possibilities in making choices that relate not only to their academic life but also to their personal life and relationships.

## Teacher as an Expert

Each teacher is required to be skilled in her own area of knowledge. Since our curriculum emphasizes a more ‘hands-on’ approach, the teacher is the expert and must lead by example and demonstration. The teacher must show and tell, and must be prepared to work with each individual learner. Since the project is in Expressive Arts, each teacher is required to be an expert in their selected area (music, visual arts, drama, dance).

## Group and Collaborative Learning

The project provides an atmosphere of collaboration, and reinforces the need to work with other learners. This is a strong feature in indigenous communities, where learning takes place between learners, and between learners and experts. Each collaborative activity allows individuals to share their knowledge and experiences, and also gain new and different ideas by working with others.

Teaching and learning through observation, trial and error, and repeated attempts at activities in developing skills is encouraged. This approach can be time consuming, but there must be room for negotiation between learner and teacher.

## Goals Oriented Learning and Short Term or Achievable Objectives

Each learning activity or module is goal oriented and the objectives are clearly set out. These objectives must be realizable by the learner in a practical way, in the context of the time allocated to the learning activity. If the activity objective or outcome is not met, the opportunity must be created to reflect on what happened and to have another go at the activity.

## Profile of Each Learner

A profile of each learner is kept, beginning with all personal bio-data. This is kept in a central place, and is accessible by the learner and the teachers only. The teachers can make entries in the profile on the activities or encounters in interviews, learning situations or other occasions that add to the profile of the individual learner. Each entry is dated and signed by the teacher. The learners are given selected times in the course of their semester to access their profiles and read through them, and then provide their own impressions and experiences of what has been undertaken thus far in their time in the learning activity. All reports in the profile are written in 'first-person' only. Use of a database computer program is important. Also a computer for each staff will enable them to retrieve a learners profile to read and make entries. Each entry has a password for security purposes.

## Evaluation of Each Learning Activity

When a learning activity is completed in terms of the time allotted to it, each person involved in the activity (teacher, learner) is requested to complete an evaluative sheet. Each of the outcomes is stated and each person is asked to indicate whether they have completed it successfully or not. Reasons for their success or failure are to be written down and discussed during the interviews and discussions with the teacher. Each of the completed evaluation sheets is attached to the profile of the learner.

## Assessment

Issues in assessment are very contentious, especially in the context of numbers, grades and sorting of learners by grades and numbers, which have been key practices advocated by many in the institution. Tests, quizzes, attendance, participation and a host of other instruments have been used previously to determine whether an individual was capable and knowledgeable. In that context Mel (1996) cites Giroux (1981) in providing an apt description of knowledge:

> *Knowledge [was] objective…an external body of information production of which appear[ed] to be independent of human beings…Objective knowledge was independent of time and place; it has become universalized [global], expressed in a…technical and value-free language.*

Our assessment for each semester is not a number or letter grade. It is a summary of the student profile, setting out what the student has accomplished in learning activities, attitudes and values towards activities and collaborative processes. The summarized profile is a key document that

speaks about the learner's experiences as well those that belong to the teacher. This is a far more comprehensive document than a number or letter grade, indicating knowledge developed on the comparative basis between student and student and between teachers and between schools.

## Conclusion

What is profoundly significant about this project is its recognition of indigenous systems of knowledge. The local view of the world, and local participation in making and realizing the world, is its underpinning theme. Numerous challenges lie ahead for this project because of the dominance of Western systems of knowledge and its concomitant institutions and structures. But the local people have been resilient and tenacious in the way they have hung onto their own histories and traditions. This project is way of reaffirming those efforts and looking forward to changing the world to suit our own needs.

Assessment has been in need of reconsideration. Since the recognition of existing knowledge and the generation of new knowledge revolve around the learners experience and interest, assessment and evaluation processes need to be open and negotiable to both teacher and learner. Previously in the dominant system there was a strong element of fear generated in the learner regarding knowledge. This has largely been due to the fact that knowledge has been made impersonal, outside of the learner, foreign. Knowledge now needs to focus on a hand-on approach where experiential choices relate to individual achievements rather than as a universal yardstick that places students against each other, and which can result in a build up of undue tension and fear in the learner.

For this new direction to work effectively both learner and teacher will need to develop a sense of collaboration in the process of generating new knowledge. The collaborative spirit requires that teachers see themselves not entirely as skilled and knowledgeable people, but as individuals with longer and different experiences and, like the learners, with an innate capacity to experience something new and different. This way of allowing the local/individual needs to preside over the choices and decisions about what is worth knowing is really a way of developing and enhancing a diversity that makes our world unique. In the face of the challenges offered by IT and marketing to make the world look the same, sound the same and taste the same, education should be about advocating difference and not sameness.

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# Shaping the Curriculum: Context and Cultures

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In this discussion I use the case of the Target Oriented Curriculum (TOC) to explore the interaction of cultures and curriculum reforms. It is argued that this reform emerged and was adapted and enacted in contexts or arenas that exhibited very different cultures. I focus on three distinct arenas that affected that reform, and examine within each of these the key interest groups and their shared understandings. The paper thus provides an analysis that stresses the fragmented, pluralistic and changing nature of culture within Hong Kong society.

## Introduction

Schooling, and the curriculum specifically, have been portrayed as both an extension of a society's culture (Reynolds & Skilbeck, 1976), and a forum in which a variety of interest groups within a society compete to promote their conception of valid knowledge (Goodson, 1994). This paper explores the relationship between curriculum and culture through an analysis of the career of the Target Oriented Curriculum, which is the most comprehensive attempt to date to reform the curriculum of Hong Kong's primary schools. We shall trace the reform from its inception to its enactment in a school and identify how it was shaped by the multitude of interest groups that influenced its creation and subsequent adaptation in classrooms. The competition to define the nature of the curriculum was intense because the reform was systemic, comprehensive, radical, rushed and introduced into a Chinese community by a departing colonial government within a period that was intensely politicised.

As Peshkin (1992) notes, 'culture' is a ubiquitous, amorphous, overused and over-defined term – to the extent that a conception to match nearly any purpose can be found. With reference to Hong Kong and other East Asian societies, culture has frequently been used in the context of education to explain the differences between the academic achievements of Asian and Western societies. Specifically, Confucianism and/or Asian values have been identified as key features of the culture of East Asian societies, and an explanation for the high levels of academic achievement of Asian pupils compared to their Western counterparts (Reynolds & Farrell, 1996). Such analyses focus on what Linton (1936) termed the universal component of culture, which depicts societies as homogenous and underscores the significance of the many smaller and specialized groups whose ways of thinking and acting are more akin to those of sub-cultures. A preferred conception of culture is that of Metz (1983), who defines it as "a broad, diffuse and potentially contradictory body of shared understandings about what is and what ought to be." The reference to 'what ought to be' captures the imperative and normative tone of curriculum reforms, whilst the stress on the diffuse and contradictory nature of culture moves beyond its portrayal as a singular and systematic set of beliefs.

Analyses of the nature of culture in Hong Kong also suggest that the doctrine of Confucianism has not been its central feature. Leung (1996), for instance, argues that there was no indigenous Hong Kong culture in the 19th Century, and the traditional culture brought from the mainland consisted of the social customs and family socialization patterns of the struggling masses, whose concerns were security and survival rather than the grandiose Confucian ideals of moral cultivation and self-perfection, and so "amorality, materialism and a pragmatic orientation

eventually prevailed over Confucian ethics in the evolution of Hong Kong culture." Hong Kong's distinctive indigenous culture has, more recently, been described as 'egotistical individualism' (Lau and Kuan, 1990), and an interaction of the themes of survival, affluence and deliverance (Chan, 1993). In terms of the impact of moral principles on behaviour, Lau and Kuan (1988) describe the preferred option as one of 'situational morality,' meaning that ideas of what is right and wrong vary according to context, and are not predicated on a universal set of moral beliefs. In brief, an interpretation of the curriculum/culture fit solely reliant on a Confucianism/Western Dichotomy would fail to capture the diverse and fragmented nature of this society.

The career of the TOC involved a clash between an innovation based on Western cultural precepts and a Chinese/Confucian culture, but the process was also more complex and fragmented, and was characterized by the competition between groups that operated within district arenas. Three different, but interactive arenas have been identified that were critical in shaping the nature and impact of the reform as it progressed from intention to practice. These could be seen to embody distinct sub-cultures or cultural orientations (Peshkin, 1992), in that the various interest groups which operated in each arena, whilst promoting their own visions of schooling, shared common understandings of their purpose, ways of acting, the nature of their audience and a distinctive discourse.

The first is the relatively private arena of policy-making, in which different sections within the state bureaucracy were predominant. Secondly, there is the national political arena, which involves the various public contexts in which a multitude of interest groups react to education policy initiatives, and promote both their visions of schooling and their interests. They include teachers' unions, the media, politicians and school management bodies. This arena was characterized by its role in providing an opportunity for public advocacy and promotion of all those groups who seek to gain public support, during a period that was increasingly critical of established institutions. The third arena is located within and across schools, and involves those groups directly engaged in the process of implementation. Whilst those operating in this arena shared a common concern for the real world of classrooms and playgrounds, there were critical differences between them – especially those associated with the three major primary school subjects (Chinese, English and mathematics), the organizational culture of individual schools and the power of participants.

In the subsequent sections I focus on each of the three arenas, and identify the various interest groups, their shared values and how these affected the TOC as it evolved from a plan and was enacted in schools and classrooms. The three arenas broadly correspond to the stages through which policy in highly centralized educational systems traditionally passes (namely: state-centred initiation and promotion; public debate and modification; and local implementation) and reflect the many manifestations of curriculum that Eisner (1979) identified (the explicit, implicit and null).

Before proceeding, it is necessary to provide a brief description of the goals of the TOC. The reform both portrayed the existing primary school curriculum and the changes they envisaged. The rationale was strongly influenced by a social constructivist view of learning. Two premises of the TOC were pertinent – the value of formative and criterion referenced assessment, and the need for pupils to learn through tasks a set of generic competencies. Despite this, two key features of primary schooling remained in place – the use of an academic aptitude test at Primary Six to allocate pupils to different types of secondary schools, and the organization of the curriculum and teachers around the three school subjects.

## The Policy-making Arena

The genesis of TOC is unclear but it seemed to evolve more from a coalescing of factors than from the linear processes of goal directed, or problem solving decision-making described by Walker (1990) and Cheng and Cheung (1995). The process was more akin to those described by Kingdon (1984), March and Olsen (1984) and Weiss (1980) who respectively describe policy as emerging from a 'primeval soup', a 'garbage can' and from 'decision creep.' Kingdon's (1984) portrayal, in which three process streams – problems, the political context, and expertise – converge, often in random ways, provides an appropriate interpretative framework. The framework requires supplementing with a fourth stream to recognize the influence on the genesis of policy-making, especially in small states, of global (or more specifically Western) developments and their capacity to provide both external precedents and justifications for reform.

Since Hong Kong achieved compulsory primary and then junior secondary schooling, in 1971 and 1979 respectively, policies have shifted from addressing questions of provision to a focus on more curriculum-oriented issues. A range of specific problems had, for some time, captured the attention of the media and policy-making community. Many of these were identified in an internal report of the Education Department (ED, 1989) and included; the highly centralized nature of curriculum development; a perception of declining standards of language proficiency; the lack of clear objectives and targets for learning; a dissatisfaction with didactic teaching styles; the competitive nature of schooling; and a concern that the changing nature of the economy (from manufacturing to service industries) required a significant reform of the school curriculum.

The political context includes swings of national mood, election results, ideological priorities and changes of administration. The TOC emerged from a climate that was dominated by the aftermath of the Tianammen Square massacre. The colonial government was portrayed by an increasingly critical local media as a 'lame duck' administration that pandered to the wishes of the mainland. In parallel, the Democratic Party emerged as a powerful political force and independent source of criticism of the government. The colonial government was thus keen in its last decade to demonstrate strong leadership, and reform of education was one of the few domains of policy in which its room for manoeuvre was less subject to external constraints than other areas, such as the political or economic systems. The fact that the government's tenure was to end on 1 July, 1997, also served to significantly change the constraints to, and horizons of, policy-making. The maintenance of the long established doctrine of 'positive non-intervention' and a minimalist approach to investment in public services were no longer paramount as the long term consequences of decisions would be borne by the post-handover government.

There was three key interest groups in the policy-making arena in government. Firstly there was the Education and Manpower Branch (EMB), which is the policy-making body, and secondly, the ED, which supervises schools and implements policies. The third composed a group of expatriate 'experts' in English language education located in the Institute of Language in Education (ILE) , whose task was to develop a comprehensive curriculum based on the policy proposals. A less fractious relationship developed between the education policy-making and executive branches of government than was evident prior to 1989 (Morris, 1996). These groups possessed a shared understanding of both the urgent need, given the political context outlined above, to produce a statement of the Government's curriculum policy intent which was visionary, radical and wide-ranging, an a highly critical perspective on the features of the existing curriculum, especially the prevailing pedagogic style. The task was therefore conceived of as partly symbolic in nature and the discourse was both rhetorical and critical, as the principal goal was to create a vision that represented the government's commitment to reform.

The process was facilitated by the international availability of a number of models of curriculum reform that involved an attempt to promote forms of outcomes based education (Spady, 1994). These served as a source of justification of ideas and of expertise. Generally, all those operating within this arena were cognizant of the pattern of global developments in curriculum reform. For example, members of the development team had worked on OBE reforms elsewhere (Australia, the USA and the UK) and EMB and ED staff were members of international educational agencies of organizations such as APEC and the OECD.

Despite these shared understandings, there were critical tensions within this arena as the interest groups described above promoted distinct conceptions of the nature and purposes of the new curriculum. The first saw it as a vehicle for introducing a regular system of testing that would serve to provide a mechanism for assessing pupils' performance, improve the accountability of schools and provide a means to select pupils who were able to attend English-medium schools. This conception had minimal implications for the other components of the existing curriculum and it was most strongly associated with the EMB and their allies, drawn mainly from the business/commercial sector. The second conception was most strongly associated with the ED, and saw the reform as a long term means to improve the existing curriculum through incremental changes to the existing core subjects. The third conception saw the reform as designed to radically restructure all key elements of primary schooling, and subsequently of secondary schooling. In contrast to the other conceptions, it envisaged an integrated curriculum, the reduction of the existing boundaries between school subjects and the abolition of the selective system of assessment at Primary Six. The group most strongly associated with this conception was the TOC developmental team. Given the private nature of this arena, these contradictions and tensions were hidden from public scrutiny.

The resulting public statement of intent (ECR 4, 1990) that emerged was a compromise that satisfied the needs of all three interest groups, insofar as it was derived from a highly derisory portrayal of prevailing practices and couched in a rhetoric that provided broad support for all three conceptions (enhanced accountability, improved teaching and systemic reform). Consequently, the basic contradictions about the purpose of curriculum reform between the groups were effectively deferred, but emerged subsequently when policy intents were translated into policy actions and in its implementation in schools. Overall, the culture of the policy-making arena was characterized by its sensitivity to the shifting political context, a focus on symbolic action, a discourse that was critical and rhetorical, the reproduction and non-resolution of key contradictions, and its linkages with international trends.

## The National Political Arena

Initially the public response to the policy proposal (ECR4) was muted, as the teachers' unions and associations representing school principals focused on the recommendation that whole day primary schools replace bisessional schools. Attention focused on the TOC when the nature and full implications began to emerge with the publication of a range of explanatory documents. The discourse became increasingly critical and derisory as the expectations of the reform became clearer and as teachers reacted to the wholesale critique of their existing practices, which was employed as a central justification for change. The media played an active role in the debate and the TOC was labelled "Totally Objectionable Curriculum." The broad picture that emerged was one of a top-down reform, based on the UK National Curriculum, being hastily imposed on schools without adequate consultation by a colonial government. Further, the intention to use the new assessment system to stream pupils into English or Chinese-medium schools was interpreted as a crude attempt to segregate pupils and enhance the status of English surreptitiously.

No other educational reform had been the subject of such intense public scrutiny and criticism. This was facilitated by the changing political environment that emerged in the early 1990s – the return to Chinese sovereignty was dominating the agenda, the electoral franchise was being broadened, Britain and China were in conflict over the pace of democratization, and a generation of politicians were emerging who required broad-based public support. Those who were successful in the subsequent elections were mainly drawn from the Democratic Party. The TOC provided an opportunity for candidates to satisfy what emerged as key elements of political success, namely to distance themselves from both the colonial government and the government of China.

The main interest groups that contributed to the debate were the teachers' union, subject associations, school management bodies, academics and politicians. The central thrust of the critique was both pragmatic and ideological. The pragmatic concerns emerged mainly from teachers and principals, and focused on poor levels of resourcing, the complexity and radical nature of the reform, its impact on teachers' workloads, and its unclear relationship with the existing features of schooling, especially the system of selective assessment which operates at Primary Six. Teachers were bemused and concerned as to the complexity and lack of clarity of the TOC, especially in terms of its expectations as to how pupils were to be assessed and what was to be done to help those identified as having learning difficulties.

At a more ideological level, the critiques reflected more fundamental tensions within Hong Kong society generally – including the elite-egalitarian divide; Chinese traditional values versus modern (Western) values; top-down versus local decision making; and child-centred versus subject-centred education. Schools with elite intakes feared a change to the status quo. A group of mathematics teachers and teacher educators was critical of the TOC for its failure to introduce more fundamental reforms to the primary school mathematics curriculum. They argued that by basing the TOC on the existing curriculum, which focused on developing memorization and accuracy skills, an essentially traditional curriculum was maintained. Others portrayed the TOC as an attempt by the departing colonial government to diminish traditional Chinese values and to bequeath Hong Kong schools a curriculum based on Western cultural precepts. The specific Chinese values that were portrayed as threatened by the TOC were the centrality of moral education within the subject Chinese and the value of competitiveness among pupils as a source of motivation and as a preparation for adult life (Morris, Lo, Chik and Chan, 1999).

There was also concern that the TOC was derived from a conception of pedagogy derived from English as a second language that was inappropriate for Chinese language and mathematics education. These concerns of subject specialists were exacerbated by the lack of consistency and confusion amongst many of those civil servants charged with the task of translating the policy into the curriculum of the three school subjects. As Clark (1999) noted, whilst the English curriculum was revised to incorporate the principles of the TOC, Chinese and mathematics responded by introducing very minor adjustments to the existing curriculum.

This highly critical public reaction to the TOC initiative slowly became less hostile and this was a consequence of a variety of factors. Firstly, the government began to provide resources and training to support teachers, and this signalled that the reform was not solely symbolic in purpose. Secondly, the definition of what TOC required became increasingly flexible – thus terms such as 'introducing TOC elements,' the 'essence' and 'spirit' of TOC were employed, which allowed the government to minimize evidence of non-compliance and claim that schools were implementing it regardless of the reality. In parallel, the government became less critical of teachers and of long established pedagogic styles. Thirdly, some of the more innovative school principals and teachers used the TOC as an umbrella for school and classroom improvements and this resulted in the

reform receiving some positive publicity. Essentially it provided an external source to legitimize internal change, and this was facilitated by its comprehensiveness and increasingly flexible nature.

Overall, therefore, the TOC served as a symbol not only of the government's vision for education, but also as a symbol of the departing (colonial) government. The culture of this arena was thus characterized by its public and politicized nature, and a discourse that was confrontational, critical and focused on pragmatic and local issues. This contrasted markedly with the global, private and rhetorical orientation in the policy arena.

## The Schools Arena

In the third arena, the culture was more complex as schools were asked to resolve the contradictions inherited from the policy-making arena within a context which, following the reform's reception in the national arena, was critical, highly politicized and shifting. Thus, as relatively open systems, the schools were influenced by and reflected the tensions of the other arenas, and these were played out against the distinctive culture and individual schools, school subjects and the tasks of implementation.

In order to understand the ways these interacted, I focus on the Paul Cheung Memorial Primary School, which adopted the TOC in 1995. The implementation of TOC in the school was studied for three years (Lo, 1999). Local primary schools have a long tradition of operating with strong hierarchical power structures, and in this school the Head operated as, and was regarded as, the supreme leader. He made the decision to adopt the TOC, senior teachers disseminated the decision and the other teachers perceived they had no choice but to comply. However, some teachers had gathered information from the media about the genesis of the TOC, and voiced concern about whether it was feasible to import a curriculum reform from overseas countries which were themselves having problems. Their voices were soon silenced as discussion centred on means of implementation. The policy-making arena in the school, which consisted of the Head and some senior teachers, saw the purposes of the TOC in a way akin to that of the EMB, but their focus was to improve the control and accountability of teachers. The Head explained:

> *TOC has very definite aims and targets that the teacher has to fulfil. This gives better control to the school to ensure that teachers are doing a good job…I see TOC as an opportunity for teachers to reflect on their actions and decide whether they want to dedicate themselves to education… or they should quit.*

In the first year, the Head and senior teachers interpreted the TOC, then produced lesson plans and teaching schedules for teachers to follow. In general, teachers took a fidelity approach to curriculum implementation and expected their leaders to provide prescriptions. Thus a strong alignment existed between the administrative policy and teachers' expectations and some changes were made, although these tended to involve compliance with the administrative requirements introduced by the Head. Although teachers were shielded by senior staff from the requirements of the policy-making arena, they were fully aware of the critical discourse in the national political arena. Consequently, two contradictions manifested themselves: one pedagogic, the other related to assessment.

Most teachers operated in a culture that adopted a technical, scientific view of teacher competency and wisdom, in which experts generate knowledge, and there are definite 'right' or 'wrong' answers, which could be acquired through a transmission model of teaching. They had succeeded within such a model, and they brought it to their classrooms. Conversely, the TOC required

pupils to be active learners and to construct their own knowledge. The new pedagogy contradicted teachers' beliefs and they were doubtful of its effect. As one teacher said:

> *I was thinking that we were educated by the traditional method, and we are able to cope with novel situations. I heard people from other schools saying this too: all of us are from traditional education and we found nothing wrong with it. A person would naturally learn to fit into new environments. That's the feedback they gave me. With this new pedagogy, it is difficult to predict whether these children will grow up to be better.*

However, on the premise that policy makers and the Head knew best and that as ordinary teachers they were insufficiently knowledgeable or senior to make comments on policies, they tried hard to comply but found themselves entangled in the contradictions between the expectations of the new pedagogy and the traditional classroom culture. For example, the traditional classroom was quiet and pupils were obedient. When they tried the more pupil-centred method, pupils got excited and the noise level rose. Some teachers were unable to tolerate this and were frequently observed breaking up activities to restore order. Many teachers became exhausted and depressed, and some complained that they felt de-skilled. Whilst most teachers conceded that pupils were generally happier, they also believed that they did not learn as much. However, a few teachers did think that pupils were learning better because it was more meaningful.

The proposed assessment system was another source of tension with the prevailing culture. Teachers had a strong belief in the function of schooling as a ladder to higher education, highly paid jobs and success in life. As one explained:

> *Hong Kong is a competitive society. If we prevent children from competing, how can they survive? I cannot imagine how they can compete with others when they are not used to competing in school.*

Schools were perceived to be both part of the selection process, and designed to train pupils to compete with and excel over others. The corollary of this was that fairness and objectivity were regarded as critical elements of assessment. A teacher elaborated:

> *I do not have confidence in my own professionalism. I fear that I would not be fair when giving marks. Some children are very naughty and you tend to give him lower marks even if they are good at speaking. It is fairer with examinations and written tests. With impression marks, I am afraid that it is difficult for the teacher to be impartial (Morris et al, 1999).*

Traditional norm-referenced and summative tests served these purposes well, while the TOC, which promoted criterion-referenced and formative assessment, was considered contradictory to the culture of the school and society. Consequently, in the first year, implementation of the reform in the school could be described as only surface and had limited impact on classrooms.

The Head perceived successful implementation as dependent on teachers' expertise and resource availability, and saw very different patterns across the subjects. He explained:

*Maths is the best, they have done everything for us, teachers are confident in Maths because there is good support. Support from English is very good too, but teachers are not confident in English because of their own weak knowledge base. Chinese is the worst. I fear TOC will fail with Chinese if no change is made. I can see little difference between what is proposed for TOC and the traditional Chinese syllabus. There should be more research on the learning of Chinese to establish the priority of learning experiences base on learning theories.*

In the second year, the Head focused on generating observable outcomes like assessment records, but also mandated a number of measures to enforce the implementation of the TOC – some of which had a more direct impact on classrooms. The measures included a mentoring system for teachers and peer classroom observations. These reduced the capacity of teachers to create an illusion of change by simply producing documents like teaching schedules indicating learning targets and lesson plans. They began to try out aspects of the TOC pedagogy and some found great satisfaction in adopting a more student-centred approach. A hybrid form of teaching strategy emerged, which combined the traditional teacher-centred strategy with a more pupil-oriented method. The result was a form of whole-class interactive teaching (Mok & Ko, 1999). Feedback from pupils' indicated that they enjoyed the opportunities to interact, and a more collaborative culture began to develop amongst teachers, who spent time jointly planning their teaching strategies and supporting each other. Their conceptions of teaching slowly shifted towards a belief that knowledge could be generated from practice. They also realised that they actually knew more about teaching than the 'experts' from the ED. The portrayal of the school as a model, receiving positive publicity, reinforced this process. But this only applied to the lower level of the school, i.e. Primary one to three. Although the school claimed to have implemented TOC to all levels, up to Primary Six, the situation was very different for the upper classes. Since pupils still had to be allocated to secondary schools according to their academic ability, teachers were reluctant to take the risk of experimenting with new teaching strategies in the face of this high stake examination. Thus, with the upper classes, teachers only complied with the requirement of reporting assessments in a TOC format, but there were no real changes in classroom practices.

In terms of assessment, a hybrid also emerged (Morris, Lo, Chik & Chan, 1999). A greater variety of assessments were used, but the selective function remained unchallenged. Teachers were able to prevent any impact on their own classrooms by complying with certain administrative requirements of the Head, e.g. undertaking criterion-referenced testing and the completion of report cards. However, this data, was subsequently converted to percentage marks and norm-referenced. Teachers became sceptical about the workload generated by these conversions and filling in assessment forms, which they viewed as administrative matters that did not contribute to improving pupils' learning. Concerns about pupil learning replaced more self-oriented concerns (e.g. workload) as a central feature of the discourse of teachers in the school.

Thus, two very different cultures co-existed and were in tension: the top-down culture of the management – characterised by clear power relations and hierarchical control – remained, but a more democratic and collaborative culture was emerging amongst groups of teachers as they developed hybrid systems of pedagogy and assessment. With the emergence of a group of teachers in middle management, the micro-politics of the school also changed. The adoption of the TOC caused a rapid expansion of the academic committee at the expense of other committees, especially the counselling and guidance committee, which was previously the core of the school's organisational structure. Later, when the head of the academic committee was promoted to deputy head, some teachers were concerned that others might be reaping more than their fair share of the benefits of the hard work of all teachers.

As the organisational culture and teachers' professional development took different paths in response to the introduction of the TOC, the power struggle amongst middle managers became more apparent. The tensions that were emerging were brought to the fore by a critical incident during the summer preceding the third year – when the Head was absent due to illness. During this time, teachers extended their collaboration and professional autonomy and began to make decisions affecting their work. Unfortunately, the Head overruled most of their decisions from his sick bed. The tension was aggravated when, on returning to school at the beginning of the third year, he announced ,without consultation. that each teacher should write every term a 150-word profile for each pupil she/he taught. As many teachers were teaching several classes, this meant that on average each teacher would write over 100 profiles each term. As teachers were already sceptical about the value of the TOC, they felt that this was the last straw and they refused to comply. They raised the matter with the school supervisory board, which sympathised with the teachers and the decision was deferred.

Subsequently, teachers felt that the Head, supported by some senior teachers in middle management, used his power to hurt those whom he perceived to be the ringleaders of the resistance (e.g. issuing warning letters for very minor offences). Some teachers started to reappraise their situation – they felt oppressed and that power was being abused, and so sought support from the school supervisors, who again restrained the power of the Head. A new culture emerged in which teachers began to discuss every policy before making a decision whether to support it or not, and this resulted in some policies being rejected. Some teachers realised that it was their solidarity that had brought about this change, and they became more supportive of each other. These formed a strong team, which adopted what Carr & Kemmis (1986) term a 'critical perspective' and this moved the school towards a conflict and bargaining model of management (Elmore, 1997).

In parallel with these shifts, the discourse of teachers also changed. In the initial period it was essentially concerned with implementation and resource matters as they struggled to comply with the Head's prescriptions. In the third year the discourse shifted to one in which issues of power, fairness and resistance became central.

Overall the impact of the reform on the culture within the school was marked and multifaceted. Teachers were clearly learning and changing through the process of interpreting the reform. In terms of professional development, some teachers moved from a restricted to a more extended form of professionalism. Some have also moved from an empirical, analytical perspective to a practical, interpretative perspective, and some have adopted a critical perspective. In terms of organisational culture, the school shifted from a top-down systems management model towards a bottom up conflict and bargaining model. In terms of curriculum change, it evolved from focusing on infrastructural and procedural changes towards changes in teaching and learning in some classrooms.

## Conclusion

Clearly, all sub-cultures are rooted in the larger culture of society, but a reliance on the universal aspects of culture tends to portray societies as homogeneous and static. The portrayal in this article intentionally underlines the discrepancies across, and commonalties within, the sub-cultures of each of the arenas identified. This analysis has attempted to trace, albeit briefly, the complex, segmented and changing nature of the sub-cultures within three different arenas that affected the TOC, and the key interest groups within each arena. These arenas served distinct functions and constituted sub-cultures insofar as their constituent interest groups operated with shared meanings and ways of acting.

The policy-making arena was shielded from public scrutiny, but its sub-culture was characterised by a shared understanding of the need for reform; a strong influence from global trends; and a reliance on a discourse that was rhetorical as to intentions, but critical and derisory of established practices, and which masked contradictory conceptions of its purpose. The public national agenda was dominated by the local political context, and this contributed to a sub-culture which was confrontational, critical and dismissive of the reform, as it was seen as a symbol of the departing colonial state and impractical. The schools arena inherited the contradictions in-built in the policy stage and its personnel were fully cognisant of the critique that the TOC received in the public arena.

This focus on an innovative school shows how the reform influenced and was affected by both the organisational and professional cultures within the school as they attempted to grapple with curriculum change. An autocratic and top-down organisational culture created the conditions for changing the curriculum, the culture of teaching and of teachers. The outcome was professional growth and eventually resistance, as the organisational culture was unable to cope with the changed culture of teachers. Clearly, different patterns and outcomes emerged in other schools as they struggled with trying to reconcile the contradictions inherited from the policy arena and the hyper-politicisation of the public national arena against the background of the culture of each specific institution.

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# Theme Three

*Partnerships for a Lifelong Learning Society*

## The Global and the Local in Partnership: Innovative Approaches to Citizenship Education

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## Indigenous Knowledge and Information Technology in Partnership

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## Interfacing Multiple Intelligences with Information Technology

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# The Global and the Local in Partnership: Innovative Approaches to Citizenship Education

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***"We are living through a transformation that will rearrange the politics and economics of the coming century. There will be no national products or technologies, no national corporations, no national industries. There will no longer be national economies, at least as we have come to understand the concept. All that will remain within national borders are the people who comprise a nation. Each nation's primary assets will be its citizens' skills and insights. Each nation's primary political task will be to cope with the centrifugal forces of the global economy which tear at the ties binding citizens together — bestowing ever greater wealth on the most skilled and insightful, while consigning the less skilled to a declining standard of living" (Reich, 1992).***

As this provocative quote aptly indicates, the planet and the human family are facing an unprecedented set of challenges, issues and problems in the new century. A recent multinational study (Cogan and Derricott, 1998) identified seven increasingly significant challenges to life on the planet needing immediate attention:

- The economic gap among countries and between people within countries will widen significantly.
- Information technologies will dramatically reduce the privacy of individuals.
- The inequalities between those who have access to information technologies and those who do not will increase dramatically.
- Conflict of interest between developing and developed nations will increase due to environmental deterioration.
- The cost of obtaining adequate water will rise dramatically due to population growth and environmental deterioration.
- Deforestation will dramatically affect diversity of life, air, soil, and water quality.
- In developing countries population growth will result in a dramatic increase in the percentage of people, especially children, living in poverty.

Even though these challenges in no way constitute a particularly rosy view of the future, some critics of globalization go further, questioning both the inherent nature of globalization and its impact. Summarizing some of these critical views, Baylis and Smith (1997) remind us that globalization is often equated with a stage of capitalism or Western imperialism and as such carries a lot of baggage with it:

- Globalization is uneven in its effects, producing both winners and losers, the latter especially amongst the poor.
- Globalization obscures accountability in that it is difficult to trace and specify responsibility
- Globalization gives rise to paradox and even processes of counter-globalization, e.g., more global homogeneity engenders fierce reactions that strengthen local identities, be they religious, ethnic or national (Baylis and Smith, 1997).

Still, if the global trends we have described are the kinds of global realities that will shape the world of the early 21st century, then what kinds of citizens are needed to function in this world? What kinds of knowledge, skills, and behaviours will they need to exhibit? What kinds of education and schooling will be needed to develop these citizens? How does one respond to these global challenges, both as a member of a particular nation-state as well as a member of the community of nations in a manner that is thoughtful, active, personal and yet with a commitment to the common good?

## Reconceptualizing Citizenship Education

Here we would argue that no less than a new conceptualization of 'citizen' is required to face these challenges. Conventional 'content-based only' approaches will be increasingly rendered obsolete. To function successfully, modern political systems depend upon an underlying conception of citizenship. This can be explicitly spelled out in a constitution, a bill of rights or some similar document, or it can be left implicit within national traditions and institutions. Moreover, any conception of citizenship implies a set of knowledge, skills, values and dispositions that citizens should possess.

Normally these attributes of citizenship sought in a particular context will vary according to the nature of the political system of which they are a part. However, they can generally be classified into five categories:

- a sense of identity
- the enjoyment of certain rights
- the fulfilment of corresponding obligations
- a degree of interest and involvement in public affairs
- an acceptance of basic societal values (Cogan and Derricott, 1998).

All five categories are conveyed through a wide variety of institutions, both governmental and non-governmental, the media and especially schooling.

To get a sense of how relevant these five attributes of citizenship would be for those living in the next century, the "Citizenship Education Policy Study" (CEPS) was undertaken, utilizing a consortium of universities that shared exchange agreements. Four national and/or regional teams totalling 26 researchers from nine nations, all specialists in citizenship education and/or research methodology, carried it out. As one of the researchers in this study, I will introduce only the key recommendation of the study, namely the proposal that 'Multidimensional Citizenship' become the central priority of citizenship education policy.

Conventional citizenship education frameworks have focused upon one or two of these attributes of citizenship to the exclusion of the others. What is needed is a conceptualization of citizenship that takes into account all of these dimensions in a single model. The CEPS study calls for a

Multidimensional Citizenship model requiring citizens to address a series of interconnected dimensions of thought, belief and action. We refer to these dimensions as personal, social, spatial and temporal, and we briefly summarize them here.[1]

**PERSONAL :** A personal capacity for and commitment to a civic ethic characterized by responsible habits of mind, heart, and action

**SOCIAL :** Capacity to live and work together for civic purposes

**SPATIAL :** Capacity to see oneself as a member of several overlapping communities – local, regional, national, and multinational

**TEMPORAL:** Capacity to locate present challenges in the context of both past and future in order to focus on long-term solutions to the difficult challenges we face

The four dimensions of citizenship - the personal, social, spatial, and temporal - are all closely interwoven. They also indicate that a citizen's sense of identity must be located at a variety of levels, ranging from the local through national to the multinational. This concept of multiple, interlocking identities clearly pervades all four dimensions of citizenship. An effective citizenship education policy must address them more or less simultaneously.

## Innovative Approaches to Citizenship Education

Here we suggest that a fundamentally different approach to citizenship education, one centered in the vision of the Multidimensional Citizenship model is necessary. This conception, while depending heavily upon formal educational approaches cannot rely upon schooling alone. Unless the wider communities within which the schools exist from local to global are fully involved in the development of citizens' multidimensionality, we cannot succeed. This, in turn, suggests the need for a new and innovative set of partnerships marked by collaboration and the use of shared brainpower to resolve problems that have local, national, regional, and global implications.

As part of a larger effort to create areas of excellence within Hong Kong's tertiary institutions, I headed a working group that used Multidimensional Citizenship as the conceptual basis for the development of a Centre for Citizenship Education at the Hong Kong Institute of Education. To give depth to the conceptualization of Multidimensional Citizenship, the Centre working group linked Multidimensional Citizenship to three internationally established academic and educational traditions within the field of citizenship education: values education, civic education, and environmental education. These three approaches have significant advantages. They focus on three highly pertinent citizenship education processes:

- The acquisition of dispositions and predilections that provide the foundation for civic attitudes and beliefs (values education)
- The building of a knowledge base for civic beliefs and skills for civic participation (civic education)
- The process of developing understanding, skills and values consistent with the notion of sustainable development (environmental education)

1. For a more detailed description of Multidimensional Citizenship and these four dimensions, see Cogan and Derricott (1998).

Bringing together the four dimensions of citizenship with three approaches to citizenship education, in educational contexts that shape the practice of citizenship education, the centre adopted a holistic approach that we label Multidimensional Citizenship Education (MDCE). This concept both builds upon and extends the notion of Multidimensional Citizenship. The four dimensions of citizenship capture the different ways in which citizenship is exercised now and will be in the future, namely the personal, social, spatial, and temporal. The three approaches to citizenship education (values, civic and environmental education) are established traditions of inquiry and ways in which preparation for citizenship are manifested in existing school curricula. Contexts refer to the educational arenas where citizenship education can be operationalized and will be studied and transformed through the efforts of the Centre.

## Three Illustrative Projects

In closing, I would like to briefly describe three projects that the centre has initiated to implement this concept of Multidimensional Citizenship Education.

**Project to Enhance Civic Education in Hong Kong Primary Schools:** With a grant from the Hong Kong government's Quality Education Fund (QEF), the Centre for Citizenship Education has initiated a project to enhance civic education in Hong Kong primary schools based on the Multidimensional Citizenship Education approach. This project works to increase teachers' knowledge in the Centre's three approaches to citizenship education: namely, values, civic and environmental education. A series of seminars and workshops are offered in 10 pilot schools and 90 project-affiliated schools to introduce these three approaches. The project also assists schools in the implementation of child-centered learning and participatory approaches in citizenship education; the development of teaching and learning resources for citizenship education; and facilitating exchange and dialogue with citizenship educators in China and the Asia-Pacific region.

**Green Schools Project:** Again, with a grant from the Quality Education Fund, the Centre for Citizenship Education has developed project on 'Green Schools' to study the implementation of principles of sustainable development in school-wide programmes. In Hong Kong the project is facilitated by the experience of a secondary school that has been running a Green School since September 1998. The QEF grant has enabled the school to initiate a school-wide environmental education programme that includes an Environmental Education Resources Centre, an Environmental Monitoring Station (air, water, and noise pollution), and a greenhouse where students can practice and experience organic farming. The aim of this project is to determine the impact of this school-wide experiential approach on students' environmental awareness, civic values, and life-style, and to disseminate the project to other schools.

**The Asia-Pacific Consortium for Citizenship Education in the Schools:** In February 1999, with support of the Japan Foundation Asia Center, the Centre for Citizenship Education inaugurated the Asia-Pacific Consortium for Citizenship Education in Schools (ACCES). The goal of this network is to enhance the development of citizenship education in the Asia-Pacific region by; encouraging a regional dialogue about the conceptualization, design and implementation of effective citizenship education programs; facilitating collaborative research and evaluation projects using the Multidimensional Citizenship Education model; and identifying and disseminating resources on citizenship education. For this purpose ACCES has formed working groups in the three approaches: values, civic and environmental education, thus disseminating and implementing the concept of Multidimensional Citizenship in the regional context. Finally, the ACCES Steering Committee has developed a research matrix based on Multidimensional Citizenship that it hopes will frame future research activities in the network.

## Conclusion

The problem with our present educational systems is that they have not, by and large, adjusted to the new historical realities – for better or worse – that have resulted from processes of globalization. This is not a statement of blame; it is a statement of an accelerated historical lag created by an unprecedented magnitude of change. Certain changes must take place in the content, the methods and in the social context of education if schools are to become more effective agents of citizen education in a global age. We believe that the concept of Multidimensional Citizenship is best suited to help young citizens meet the challenges of the millennium. In our view, Multidimensional Citizenship Education also represents something new and distinctive in that it builds upon and goes beyond these more traditional conceptions of citizenship and citizenship education and speaks directly to what are anticipated to be the challenges of the 21st century in both local and global contexts.

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# Indigenous Knowledge and Information Technology in Partnership[1]

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There is a fundamental paradigmatic shift awaited in developmental thinking. By placing an emphasis on resources in which disadvantaged rural and urban poor were inadequate, the outside institutions and developmental agents assume the role of resource provider. Since the people were receivers, they became not only dependent, but also lost some of their dignity and self-respect in the process. Once we move away from this approach and start building upon a resource in which poor people are rich, in terms of their knowledge, innovative potential, creativity and associated cultural resources, the process of development becomes more dignified. In fact, we are on the receiving end and the people become providers. The reciprocity that we may show through our contribution in adding value to these innovations becomes a fee that we must pay for learning in the university of grassroots innovations. What appears to be so obvious may actually not be so to many people. If this were not true, then we would have found a basic departure in our approach to the subject. The information technology (IT) applications can help in not only democratizing knowledge, but also in overcoming the asymmetry in formal and informal knowledge systems.

I want to address first the relationship between the nature of knowledge systems that evolve at local level, and the institutional context which somehow stifles their growth. I would then look into the alternative ways in which we can modify the institutional context by expanding the critical, but appreciative, peer group of the innovators beyond the boundaries of local villages or urban communities. Once new peer groups are formed, the values, the institutions and culture that help the formal knowledge systems come into play. We are meeting at this conference with the hope of learning from each other and expanding our horizon of thinking, making our actions more responsible, and the impact of those actions more relevant, for the people for whom we work. Similarly, local innovators (whether individuals or communities) and outstanding traditional knowledge experts need to learn from each other. IT can help in overcoming the gap between dispersed and disjointed innovators, and help them speed up the rate at which innovations mature. "The Honey Bee" multimedia, multi-language database is a step in this direction. The "Knowledge Network for Augmenting Grassroots Innovations" (KnowNet-Grin) provides an operational framework for achieving this goal. It is my contention that dialogue with local knowledge experts will help the formal science and technology knowledge systems become more robust, compassionate and committed to solving problems in a sustainable manner. However, we will have to move away from a classical problem solving approach to a solution augmenting approach.

1. The full title of this paper is "Indigenous Knowledge and Information Technology in Partnership: Innovative Approaches: Transforming Developmental Options for Knowledge-rich, Economically-poor people: From Grassroots Innovations to Global Space."

## The Institutional Context of Local Knowledge and Creativity

In a recent paper (Gupta, 2000) I demonstrated how the creative and innovative traditions in various developing countries have been masked by historical misrepresentations by outsiders, as well as by pedagogic and policy-induced blinders domestically. From an early age students learn the major inventions made by Europeans, and rightly so, but seldom do they learn about grassroots or higher level inventions and innovations developed by local individuals, institutions or communities within their respective countries. When local contributions are indeed taught, these are recalled with terminology which may generate disdain rather than respect native genius. But this is only one reason why the possibility of building upon grassroots traditions of invention and innovation has not been pursued in most developing countries. There are several other possible reasons for this, such as;

- a lack of awareness about such traditions among policy planners, the education systems, and civil society at large;
- the influence of aid agencies whose work often results in increased dependency rather than self-reliance;
- an education system which does not create curiosity and an experimental ethic, and instead reinforces a culture of compliance and conformity;
- the science and technology establishment which does not encourage local traditions even if they are functional and viable, whether in the past or in the present;
- the increasing influence of the media which popularize Western images of progress and so-called 'development' rather than indigenous notions of the same;
- the lifestyles of the elite which do not inspire any respect for local knowledge systems;
- declining respect for local healers and herbalists among their own communities, who are exposed to modern medicine capable of instant effects, irrespective of side effects;
- declining communication between the 'grandparent generation' and the 'grandchildren generation' due to the disappearance of extended families and the increase of nuclear families;
- a lack of incentives for creative people at the local level;
- most importantly in this context, inadequate intellectual property rights for local communities, informal innovators, and so on.

Many times researchers have tried to portray traditional knowledge systems as totally different and opposed to the so-called modern and Western knowledge systems. Nothing could be further from the truth. Some aspects of traditional knowledge systems contain most of the elements that make a scientific proposition valid. At the same time, many scientific institutions use traditional cultural symbols and practices to generate an extra ounce of confidence or certainty. For instance, when a farmer decides to sow his crop at a particular time, taking various factors such as meteorological conditions, soil, moisture, temperature, etc., he is using his empirical knowledge which generates replicable, refutable, and verifiable results. No matter who sows crops at that time under the given conditions, other things remaining the same, he or she should get the same result. Likewise, every time the same crop is sown with similar conditions, it should give similar results and if one wanted to prove this wrong, it should be possible to sow early or late and get different results.

The scientific nature of much traditional knowledge forms the basis and philosophy of grassroots innovators' own initiatives for benefit sharing. For example, the Honey Bee philosophy about the scientific nature of local innovations was the basis for the creation of the Honey Bee Network a decade ago. At the same time, members of Honey Bee Network realized that there are cultural codes and institutional mechanisms associated with some of the traditional knowledge systems which ensure that the knowledge, innovations and practices are understood and explored in a given context. This is not to say that all the elements in this context are scientific in nature. Cultural contexts based on shared beliefs may provide a basis for dealing with a whole range of uncertainties, and at the same time provide a common understanding of social, biological, cultural continuities.

Whenever some members of a community recognize the need for a discontinuity, a major transformation takes place. When a new crop is introduced, a new implement is invented, a new variety is developed through selection or sometimes through grafting or budding -- an innovation takes place. Some of these innovations, over a period of time, get embedded in socio-cultural contexts. While constructing a modern building, setting up a laboratory, installing a new machine, prayers are routinely held in many parts of the world as if the technological insurance is not sufficient, a kind of spiritual assurance is sought even in most of the modern institutions. It is true that causal explanation of modern scientific proposition is sought and provided in the material structures of science i.e. verifiable principles governed by universal laws and which can be tested and measured. In certain aspects of traditional knowledge systems, non-material beliefs and cultural codes are supposed to explain or guide the consequences of material transactions. For instance, a healer may not reveal his or her knowledge lest it loses its significance on being told. It is possible that this belief, seemingly unscientific, might have been a means of ensuring that a complex or risky recipe is not pursued or practiced by someone untrained or untutored in the art. It is also possible that it is just a superstition, but in any case it lends coherence to the knowledge system and the surrounding context.

It is not my contention to argue that traditional knowledge systems and associated institutional arrangements cannot be dismembered at all. However, in many cases, when we take a plant or some other element of local knowledge systems out of its institutional context, even if a scientific relationship between cause and effect does not get adversely affected, the institutional context in which the plant is collected (for example, only when necessary and only in limited quantities) may be affected. Therefore, we may be able to develop a good and effective drug by just dealing with the utilitarian part of the traditional knowledge systems. But we may not necessarily maintain the restraint that may have been kept in place by some of the traditional institutions for conservation of that plant. That is the reason why many groups oppose bio-prospecting by outsiders - in order to avoid the risk of over exploitation of the resource itself. However, what they miss is that the problem is not so much with bio-prospecting, as with the institutional arrangement.

The context of local knowledge systems, combining traditional skills, culture and artefacts with modern skills, perspectives and tools, is not something that has happened only in the recent past. From time immemorial, new crops were introduced from one part of the world to another and cultural and ecological knowledge systems evolved while adapting these crops, animals, trees and tools into their new contexts. This is an ongoing process. What may set the traditional ways of dealing with local resources and external knowledge and inputs apart, may be a slower trial and error approach which may not necessarily be unscientific. But, it may not be fully compatible with modern methods of experimentation, validation, and drawing inferences. In some cases the correspondence is close, but in many cases it may not be. However, it is possible that through flexibility, modification and mutual respect and trust, traditional knowledge experts can and may work with the experts from modern scientific institutions to generate more effective solutions for

contemporary problems. After all, the 'tool view' of science, implying excessive reliance on specific methods of solving problems, has never helped in taking scientific research very far. Traditional contexts reflect and embed certain rules about how we relate to nature, to each other and to our inner selves, which can help in generating sustainable and compassionate approaches to solving problems. Incentives for creating a sufficiently strong desire for experimentation will become embedded when modern institutions expressions of local creativity of individuals as well as communities based on traditional as well as modern materials[2].

## Limitations of Honey Bee Model without Information Technology Applications

It was realized some eleven years ago that, both on efficiency and ethical grounds, the prevalent modes of knowledge extraction from the people, and dissemination among them, were non-sustainable. Peoples' knowledge has been utilized in some cases for developing value-added products, for instance, in the herbal or plant-derived drug industry, or in improving crop productivity by using local land races. In either case, the beneficiaries of the value-added products were not the same as the providers of knowledge and the related resources - in this case biodiversity. In addition, there were large numbers of indigenous innovations, many of which were green, such as herbal pesticides, veterinary medicine, farm implements, and so on, and had never become the basis for modern technological development. While there were numerous public/private channels for diffusing innovations produced in the formal sector, similar channels for diffusion and value addition of informal innovations were not available. So much so that knowledge-rich but economically-poor people could not benefit, particularly in marginal environments, from the formal technologies, nor could they learn from the informal innovations, due to lack of extensive knowledge networks. The local knowledge networks did exist within a community and were responsible for survival of disadvantaged people in regions where market and public systems were weak.

It was to overcome this gap that the Honey Bee Network was born eleven years ago. It was started essentially to scout, experiment, improve if possible, and disseminate local innovations across language and cultural barriers. The Honey Bee Network has been documenting grassroots innovations for sustainable natural resource management for the last eight years, and has built a database of thousands of such innovations. These innovations include a wide range of herbal, artisanal and other innovations for non-chemical pest control, veterinary medicine, animal health and productivity, soil and water conservation, growth promoters, farm implements, low-energy-requiring three-wheel tractors, a tilting bullock/camel cart and so on. However, the Honey Bee was essentially a text-based network. This severely limits access by illiterate farmers. And, as time has passed, we have realized that real-time connectivity must be organized among the grassroots innovators if green technologies are to be given a real thrust.

2. In many Mali villages, if food storage vessels made of dry gourd skins get cracked or broken a Bela woman would stitch the pieces together with plastic cords so that these natural biomass-based vessels can last longer. This is an excellent example where the culture of recycling and repair, which is so integral to traditional communities, combines a traditional vessel with modern plastic cord. Likewise, in a workshop in the Chittradurg, a district of Karnataka, India, a creative carpenter had a wooden plough made of acacia wood. When the shears got worn out, he still wanted to use the same plough. However, he wanted to put a shoe of metal on the worn-out shear. He found that the waste spring leaves or suspension springs of automobiles provide the right material having the appropriate combination of weight, torque, durability, etc. Similarly, the automobile repair workshops on the roadside use soap to plug small holes in the radiator. It is this approach of combining a traditional resource with modern materials that sometimes may not happen so obviously in the modern laboratories and academic research institutions.

One of the major impediments to the growth of grassroots innovations developed by farmers and artisans has been found to be the lack of an appreciative, but critical, peer group. This happens through several socio-cultural processes, valid not just in developing countries:

- Familiarity breeds contempt. People in the same village in which an innovator has developed a unique solution do not recognize and encourage the person till outsiders recognize the person. Sometimes the indifference may convert into much more aggressive contempt.
- The innovations remain sub-optimal because feedback is not available in time or in sufficient detail.
- Since there are only a few, or sometimes only one or two, innovators in a particular locality or village, the critical mass does not evolve, i.e. a peer group does not emerge locally.
- Some of the extraordinary initiatives do not appear to be so to the person concerned till he/she is exposed to some other similarly unique ideas, etc.

There may be many other factors that are responsible for lack of networking among grassroots innovators but it is obvious that lack of communication and awareness about each other is a major one.

Cross-cultural fertilization of ideas and initiatives is one of the fundamental tenets of the Honey Bee Network. While it is true that considerable cultural diversity exists within India, it is also true that homogenization of expectations and perception through popular media masks some of these differences. Previous research by us has shown that there are sometimes extremely innovative and comparable solutions generated in other continents for solving similar problem, such as the same pest in the same crop. Rhinoceros beetle on Coconut is a problem in Columbia, Sri Lanka, Karnataka and Gujarat. In each case some common and many dissimilar innovations have been developed.

## Major Limitations of the Honey Bee

There were some major limitations in the Honey Bee network:

- It relied primarily on textual communication in different languages, though, to some extent, face to face interactions do take place in the experimenters' club/workshops. Similarly, there are other diffusion strategies involving organization of stalls in cultural and agricultural fairs; biodiversity competitions among school children, college students and departmental officials; participation in a few exhibitions; on-farm research, etc. These were, by their nature, extremely time- and resource-intensive, and thus limited in their reach.
- The network, created at the Honey Bee central node and its regional language centers, received queries from the farmers regarding some problems that they were facing, or comments on the solutions published in the newsletter. However, due to quarterly periodicity of the newsletter, the turnaround time of information and knowledge on different problems was very long.
- The incentives for sharing information, in anticipation of a quick response and feedback, were few because of the previous point. Similarly, the pressure on scientists to respond to farmers' queries was also low. One consequence of communication lags in the Honey Bee Network was that the competitive ability of non-chemical technologies, over the chemical and environmentally-unfriendly technologies, went down. Unless the response time is quick and the quality of response is rich, the ability of green innovations to compete and survive in the marketplace is much reduced.

- In the absence of an electronic database, which has the possibility of establishing contact between innovators, investors, and entrepreneurs (the golden triangle for rewarding creativity), the market potential of a large number of innovations was not fully realized. While a Web site did exist, the limited spread of the Internet in developing countries, and the even more limited knowledge networks in local languages, the triangle of creativity linking innovation, investment and enterprise was not formed.
- In the absence of any registration system which provides incentives to grassroots innovators for disclosing their innovations, the intellectual property rights (except copyright) were not protected, due to publication of the innovation. The textual registration system was not conducive to the existing electronic systems at the World Intellectual Property Organization (WIPO), or other patent offices that may agree to register various innovations.

## Solving the Lack of Peer Review

As mentioned previously, one of the major impediments to the growth of grassroots innovations, has been found to be the lack of an appreciative but critical peer group. The KnowNet-Grin is being created as a wide area network of some mobile and some stationary nodes in Gujarat and two or three other states. Innovators around these nodes will discuss specific innovations online and submit their feedback to the concerned innovator whose idea is being discussed. It is hoped that collaborative learning among innovators will be accompanied by competitive spirit to produce newer innovations. To ensure that women are not left behind in the process, special kiosks as well as printed wall newspapers or magazines will be developed to share the discussions with them, until they familiarize themselves with the use of computers. Touch screen interface with multi-language capabilities have already been developed which could enable access to innovations, entry of new innovations and communication of feedback on the existing innovations.

## Safeguarding Intellectual Property Rights of Innovators

The conventional patent system in India provides only for process patents, not product patent. However even in such a case, the cost and skill required for filing patents are not within easy reach of very many small innovators. SRISTI has proposed a model of INSTAR (International Network for Sustainable Technology Applications and Registration) as a global registry of innovations, to safeguard at least the priority of innovations. We realise that for each nation to develop a country specific systems will take long time and may be too costly. The fact that the Trade-related Aspects of Intellectual Property Rights (TRIPS) provides for negotiations on developing an international registry of wines, provides the context for similar registry of local knowledge, innovations and outstanding practice registration.

A web based market/clearing house of innovations might also help link innovation, investment and enterprise. The challenge is to put synoptic information of the innovation in the public domain, so that interested parties may contact the clearing house (GIAN in Gujarat and NIF in India, and SRISTI globally) for negotiating the licensing of technologies. Simultaneously an effort will be made to pursue with WIPO and the World Trade Organization, the issue of according such a registry a legal protection form unauthorized copying or working of innovations.

## Linking 'Little' and 'Big' Science, Business and Students

A node will be provided where practicing executives from business ventures attend various training programmes at IIMA. The idea is that some of them may have an interest in participating in the ongoing discussions on specific innovations, and contribute their ideas about marketing, business policy, technological design or any other aspect of the scaling up of innovations. Likewise, nodes will be provided at research and development centres in private and public sectors to link local 'little' science with the formal 'big' science. The students at IIMA and some other institutions will also be involved in participating in the Knowledge Network.

## Database Development

It is proposed to develop a web based database with multi-language capabilities, so that anybody can submit an innovation through a private or a public kiosk by going to the site of the Honey Bee Network and NIF. It should be possible to send entries through the Honey Bee interface to this database. The online registry is already operational at NIF's website (www.nifindia.org). The innovators or other interested people should also be able to send a request for public domain information, by sending an email or submitting a request through the web to this database.

## Conclusion

IT applications for augmenting grassroots innovations can provide new ways of overcoming the asymmetry between knowledge-rich, economically-poor people and the rest of the society, which has extracted their knowledge without proper accountability. The ethical basis of knowledge extraction and asymmetrical basis of reciprocities need to be reconsidered.

The Honey Bee philosophy provides new way of forging partnerships between people and the programmes ostensibly aimed at helping them. It triggers a new model of poverty alleviation, and generates a new kind of accountability amongst those who have benefited from this knowledge systems and the people who have conserved this knowledge despite remaining poor themselves. If erosion of knowledge is to be stemmed, the knowledge producers and innovators have to be recognised, respected and rewarded. The pedagogy and curriculum of education will need to be changed. The IT applications provide one way, but only one way, to achieve these goals. The global space and civil society support have to be harnessed for local innovations. SRISTI and Honey Bee Network have organized a second international contest to scout innovations, whether technological, educational or institutional, at a grassroots level. I hope that this conference will help find new partners in our mission of building upon the resource in which poor people are rich.

# Interfacing Multiple Intelligences with Information Technology[1]

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## Introduction

The reality is that we live in an information technology-ridden world. Whether directly or indirectly, our lives are greatly influenced and affected by such rapid developments. IT's vast potentials and capabilities are changing how we do things, what things we actually do, what things we learn about and even when we learn about them. Most importantly, as individuals, it is also changing how we learn. This must be the greatest impact of technology for mankind. The challenge is to learn how to use these modern technologies, specifically, the electronic and computer-based technologies, and integrate them into teaching. Our mission is to empower each individual's multiple intelligences by harnessing IT in education.

## Definition of Terms

Technology is more than a collection of machines and gadgets. Technology also refers to a system, a set of procedures, a methodology or merely a way of acting or doing things. Information Technology (IT) refers to all systems, methods, procedures, equipment and tools that provide access to information. This discussion shall focus on computers, computer-based systems and the Internet. Technology in Education or Educational Technology is therefore a fusion of instructional procedures with instructional information technology tools, to achieve maximum learning.

While Technology Education and Technology in Education are found to be interchangeable and synonymous by some professionals, I use them in different ways. Technology Education is the actual study of operations and development of specific technologies, for example computer programmers, systems analysts, network engineers, and so on. Their undertakings see technology as an end in itself. This is Learning About Technology. On the other hand, Technology in Education or Educational Technology (EdTech**)** is learning with information technology. How we use IT in learning to count, generate a reaction paper, record the results of a science experiment, finish the script for a drama class, and so on. In this regard, IT is only a means to an end.

## Back to Basics - Why Educational Technology?

For technology-inclined educators, parents and students, it is common sense to integrate IT in the teaching and learning process, for obvious reasons. However, such presumption raises issues, such as what are the costs versus the benefits? What are the investments versus the 'return' of increased learning, and is there any conclusive data on the advantages of educational technology? Another issue relates to the magnitude of educational technology. To what extent do computers

1. This section is adapted from a multimedia presentation.

takeover the teacher's job? Will it replace the teacher? Up to what levels and in what subjects should educational technology be applied?

Instead of trying to convince you that EdTech really works, allow me to state the inherent characteristics of IT and relate them to the teaching-learning theories of 'directed instruction' and 'constructivism.' Advocates of directed instruction see this method as a teacher-directed form of systematic instruction, which uses systems approaches. This same group believes constructivism focuses on self-directed 'discovery learning.' They see constructivism as an unstructured form of learning, as opposed to directed instruction's systematic method of teaching. On the other hand advocates on constructivism describe directed instruction as teacher-centred, and prefer a student-centred model. They favour constructivism because they believe it is based on 'knowledge construction,' rather than knowledge transfer. They say constructivism is based on generative learning models, rather than the transmission models of directed learning Despite their differences EdTech can be useful for practitioners of either teaching-learning theory.

***Needs Addressed by EdTech for the Two Instructional Models***

| Directed Instruction | Constructivism |
|---|---|
| Individual pacing and remediation, especially when teacher time is limited | Making skills more relevant to students' backgrounds and experiences by anchoring learning tasks in meaningful, authentic, highly visual situations |
| Making learning paths more efficient (e.g. faster, especially for instruction in skills that are prerequisite to higher-level skills) | Addressing motivation problems through interactive activities, to which students must play active rather than passive roles |
| Performing time-consuming and labour-intensive tasks (e.g. skill practice), freeing teaching time for other, more complex student needs | Teaching students how to work together to solve problems through group-based, cooperative learning activities |
| Supplying self-instructional sequences, especially when human teachers are not available, teacher time for structured review is limited, and/or students are already highly motivated to learn skills | Emphasizing engaging, motivational activities that require higher-level skills and pre-requisite lower-level skills at the same time. |

## The Characteristics of IT

There are benefits for learning/teaching which relate to the physical characteristics of IT. For example the retention rate for information gained through reading alone is about ten percent, retention of information gained through hearing is about 20 percent, and through seeing about 30 percent. When seeing and hearing are combined retention rates rise to about 50 percent. But when hearing, saying and doing are combined the retention of information rises to about 90 percent.

Computers display text for students to read. They can produce sound and music, thereby stimulating the sense of hearing. Pictures, video and graphics can be displayed, thereby allowing the student to 'see' the information. EdTech need students to enter data, or make a verbal response or movement through input devices, thereby requiring students to hear, say and do. By combining computer applications and peripheral devices such as headphones and microphones, high information retention rates can be achieved.

***Information Retention Rates***

| Activity | Retention Rate | Computers |
|---|---|---|
| Reading | 10% | Display text |
| Hearing | 20% | Produce sound and music |
| Seeing | 30% | Displays pictures, graphics, video |
| Hearing and Seeing | 50% | - do - |
| Saying | 70% | - do - |
| Hearing, Saying and Doing | 90% | Needs user to enter data, response or movement through input devices |

EdTech also has many abstract advantages, which are not obvious at first glance. In terms of motivation, EdTech gains the learner's attention through production and increases perceptions of control. Its unique instructional capabilities allow self-paced learning, it links learners to information sources and helps them visualise solutions and problems. Edtech also enables a diversity of interest/subjects for all learners, links learners to learning tools and tracks their progress.

Edtech provides support for new instructional/learning theories and strategies by allowing cooperative learning and shared intelligence. It increases teacher productivity to support problem solving and higher-level skills. It also frees up teachers' time to work with students by helping with production and record-keeping tasks. It does this by more quickly providing more accurate information, and by allowing teachers to produce better-looking, more 'student-friendly' materials more rapidly.

## The Perfect Combination: MI + IT = $(L)^n$

When combined with other IT software applications, hardware and peripherals, especially those that target specific areas of interest like music and animation, more intelligences are enhanced. Integrating Information Technology with multiple intelligences exponentially increases the learning experience of each individual. It can be seen that information technology and multiple intelligences are a perfect combination.

***Combining IT and MI***

| Computers | MI |
|---|---|
| Logical device | Logical-Math |
| Set of instructions (programs) | Linguistic |
| Operating Systems<br>Text-based<br>Graphical User Interface (GUI) e.g. Windows-based | <br>Linguistic<br>Visual-Spatial |
| Data entry (e.g. keyboard, mouse, screen, etc.) | Kinesthetic |

## Integration Strategies

There are many different approaches to Educational Technology. Teachers may often find themselves applying several strategies. Some choose certain technologies for their ability to address particular learning styles. Others select the technology that is best suited for their learning objectives. There are also educators who take advantage of a technology's ability to supplement their institution's learning resources. Under these circumstances, it is important that we maintain our focus and note the major difference between Educational Technology and Technology Education.

***Suggested Strategies for Directed and Constructivist Approaches***

| Directed Instruction | Constructivist |
|---|---|
| To remedy identified weaknesses | To generate motivation to learn |
| To promote fluency or automaticity of prerequisite skills | To foster creativity |
| To make learning efficient for highly motivated students | To facilitate self-analysis and metacognition |
| To optimize scarce resources | To increase transfer of knowledge to problem solving. |
| To remove logistical hurdles | To foster group cooperation. |

## Developing a Technology-Integrated Curriculum

I would suggest some guidelines for developing a technology-integrated curriculum. These include the need to plan for a specific period, be it monthly, quarterly, semestral or for the whole school year. Allow enough time for the development of the new curriculum. Match the assessment to the activity. Importantly when working in a new and evolving field – be flexible and don't be afraid to experiment.

# Concluding Synthesis

## The Way Ahead

*Victor Ordonez*
*Former Director, UNESCO Asia-Pacific Bureau of Education, Thailand*

# The Way Ahead

*Victor Ordonez,*
*Former Director, UNESCO Asia-Pacific Bureau of Education*

Excellencies,
Distinguished Participants,
Ladies and Gentlemen,

I am reminded this morning of the story of how the medieval monk Augustine was walking along the seashore contemplating how he could understand the universe and his God. An angel appeared to him and promised to give him that understanding, if he could first pour the entire ocean before him into the pail he was carrying.

In similar fashion, I feel a little like being asked to pour an ocean into a pail, in attempting to summarize the week's rich deliberations into twenty minutes. The task is even more difficult than that in standard conferences for two reasons: First, the annual ACEID tradition of concurrent sessions has become a recognized marketplace of innovative education ideas throughout this region, so that this year we have over a hundred such sessions, in addition to the special interest group meetings, the roundtables, and plenary sessions. Second, this year's theme is far more complex then others in the past. Based on your feedback, UNESCO's Asia-Pacific Bureau of Education responded by identifying four dominant themes: globalization, information technology, indigenous knowledge, and multiple intelligences. I originally worried as to how these four major topics could be woven together for an overriding theme. My fear was unfounded; you will testify that these themes indeed came together very well this week.

From the opening addresses of Mr Anand, Dr Bravlavsky and Mr Kinelev, all the way through the plenary and active group sessions, the ideas planted in the four gardens of the four themes came together in a veritable forest of exciting new ideas. It is thus impossible for me in my few minutes to mention or even catalogue all of these. I am sure you have identified and chosen your favourite ideas and insights to bring home. I too have picked my highlights from the gardens of ideas and, without meaning to be comprehensive, I have woven these ideas together into a *kakala*, using Professor Konai's analogy, a garland not of flowers but of insights and things I learned. My *kakala* has four clusters of flowers or rather ideas, around four major ideas:

This week we not only talked about the potential and perils of information technology, we also experienced it. We witnessed hi-tech presentations from Ms Valmonte and Mr Gupta, self-confessed low-tech presentations from Mr Hughes, and now from me, even a no-tech presentation, devoid of screens or computers. We were reminded, both in the lectures, and implicitly by its use, how such technology can be so well used, and sometimes ill used, under-used, or over-used. Ms Villanueva made a key distinction: IT can help us to two different ways: either to do better what we already do (as Mr Kanchit used PowerPoint to illustrate an otherwise standard lecture), or to do something entirely differently (as Ms Valmonte did with a bombardment of sounds and images).

I confess, I was more comfortable with the former presentation than the latter, because I was more used to the academic format it embodied. But upon reflection, I realized that the latter presentation was indeed the way of the future, for it reminded me that that is the way media communicates nowadays, and more importantly, that is the way the next generation have come to think and absorb their inputs, via MTV and other means. It reminded me of a more important truth; unless we teachers begin to understand the new and different ways the youth think and learn, we will not be effective teachers.

The impact of technology on the way we behave and think cannot be underestimated. One does not even have to talk about computers to realize this. The simple device we all use, the television remote control, is a perfect analogy for this. It was devised simply to save us the inconvenience of having to get up from the couch to change channels, presumably a few times an evening. What resulted was, because of its convenience, that we change channels dozens and hundreds of times a night, often even within the same program, as we avoid dull moments, or try to catch two programs at the same time. The effect of this is that we have dramatically raised our threshold of expectation and lowered our tolerance for anything not spellbinding, implicitly shortening our span of attention. It has driven media to be more spectacular, more dynamic, with new surges every few minutes if only to prevent the viewer from reaching for the guillotine of the remote. The impact on the viewer, and for us, the student, is that now he or she is so easily bored and cannot long sustain a difficult intellectual session without added stimulation. The teacher has to be more and more a performer, and study has to be more and more attractive. We have not begun to assimilate the implications of this. Using Ms Villanueva's framework, if the learner and the context have changed, the teacher and even the content must also change.

Second, globalization, for better or worse, is an inevitable reality, but it does not mean that we have to passively accept all its implications. There is a need to swim upstream against this incoming torrent. As they say, it takes a live fish to swim against the current; a sick fish or even a dead fish can just go with the flow. Mr Grossman pointed out the polarization implications of globalization; the rich will get richer and the poor poorer, with all the tensions and inequities that implies. My research has reinforced this. Up to the mid-seventies, free trade and global markets did indeed increase incomes generally. But after that the wealth/poverty gap, not only between nations, but more worryingly even within tiger economy nations, started to grow. Now 20 percent of the world's population controls 80 per cent of the world's wealth, and it is getting worse. Governments must swim against the current in the free market competition, avoid this 'race to the bottom' in providing incentives and cutting on government revenues, and ensure minimum government support for social safety nets, and for basic education to start with.

In the sphere of education, we have heard many times, that preparing our students for a globalized future, so necessary as that is, must not take away from making him or her aware of and proud of his or her own identity and culture. Mr Anand painted a picture of how this balance should be achieved; on a more practical level, Dr Rung illustrated how this is done by incorporating different dimensions of "Thai wisdom" into their curricula. Mr Hughes and Professor Kanai also provided illustrative case studies of Aboriginal studies and Pacific Island mentalities, respectively, incorporated into traditional subjects of math, language, and history. Other speakers of course pointed to the need for balance and integration (Mr Morris); local knowledge must always be enriched with universal knowledge from outside (Mr Gupta); such balances must be reflected in higher education as well, especially since the pace of change there is much slower than industry (Mr Kanchit); great care must be given to which aspects of local culture are to be preserved (Mr Anand).

The third overwhelming sense I got was that everyone was calling for an expanded vision and concept of education, far beyond merely the transmission of information. The fast changing environment of the future calls for more than just traditional subjects taught in traditional ways. The themes of the special interest group sessions were an indication of this: on HIV/AIDS, on citizenship training, on values education, on environmental protection, and so on. As the student is not a disembodied brain but a total human being, a holistic approach to his or her formation was emphasized by all three plenary chairs, Ms Quisumbing (emphasizing values), Mr Tenedero ("The heart of education is education of the heart"), and Mr Khandelwal (quoting Tagore). This was echoed in many different ways: in the discussion of multiple intelligences by Ms Habito, in the reference by Mr Kinelev of the UNESCO Delors four pillars of education, in the concept of multidimensional citizenship expanded by Mr Grossman, in the new knowledge and global competencies and attitudes required by the future as expounded by Ms Mok, the challenge to the limitations of traditional testing by Mr Mel, and in the curriculum revision based on Intelligence Quotient, Diligence Quotient, and Emotional Quotient illustrated in one of the concurrent sessions.

The conference seemed to emphasize the importance of action over words, of not just talking about problems but actually going about solving them. I was pleased to see that many presentations were not of theoretical constructs but narrations of actual experiences and lessons learned from these. Speakers did not only talk about what can be done, they had actually done it. So we learned from real life experiences in post-colonial Hong Kong (Morris), computer-based lesson planning (Valmonte), incorporating Thai wisdom in education (Rung), Aboriginal studies adaptations in Australia (Hughes), capturing innovations in a Honeybee network (Gupta), and many other examples in numerous concurrent sessions.

It is my hope that this experience sharing not only leads to conceptual insights, but inspires all participants to apply in their daily work the new fruits of these insights.

In fact, there is an added specific assignment given to me by the conference organizers today. They have asked me to emphasize the importance of the last session of the conference, right after this talk, when you will be breaking up into discussions groups to work out practical implications of what you have learned and translate them into doable, measurable resolutions for action in your own work. The measure of success of this conference is not, after all, how good the speakers were, or how we feel at the end of the week, or even (given the test mentality) how well we would do on an exam about the lectures given. The true test is the extent to which this conference will improve and change the way you work when you return. In that sense we will not know if this conference has succeeded until you come back next year and tell us what has changed because of it. So conference organizers and I agree that the next hour could well be the most critical and important of the whole week. Reflect, discuss, and formulate clear actions plans that can make this whole experience worthwhile.

Ladies and gentlemen,

This then is my *kakala*, my garland of highlights from this conference, arranged from four bouquets of ideas: the potentials and perils of information technology, the need to balance globalization with equity and indigenous aspects, the expanded vision for education of the future, and the importance of translating words into action.

My *kakala*, like yours, has many other flowers to embellish my memory of this conference; the reunion with old friends and colleagues, the grace of the Thai classical dances, the hospitality and generosity of our Thai hosts, of NEC and UNESCO's Asia-Pacific Bureau of Education, of the hotel and of all those who quietly served behind the scenes, the informal conversations over dinner which inspired me with the hopes and dreams of so many of you.

But as Professor Konai reminds us, *kakalas* are not made by someone for his or her own benefit, they are meant to give away to those you hold dear. And so in this spirit, I offer you my version of the conference *kakala* of ideas, knowing that I value your potential for reshaping education for the future, and hoping that this garland will not just be put aside on a shelf, but will be used to inspire you to make significant improvements in your noble work. I wish you Godspeed and every success.