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# Educational Issues for Sustainable Development in Africa

INSTITUTE FOR
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UNIVERSITY OF JYVÄSKYLÄ

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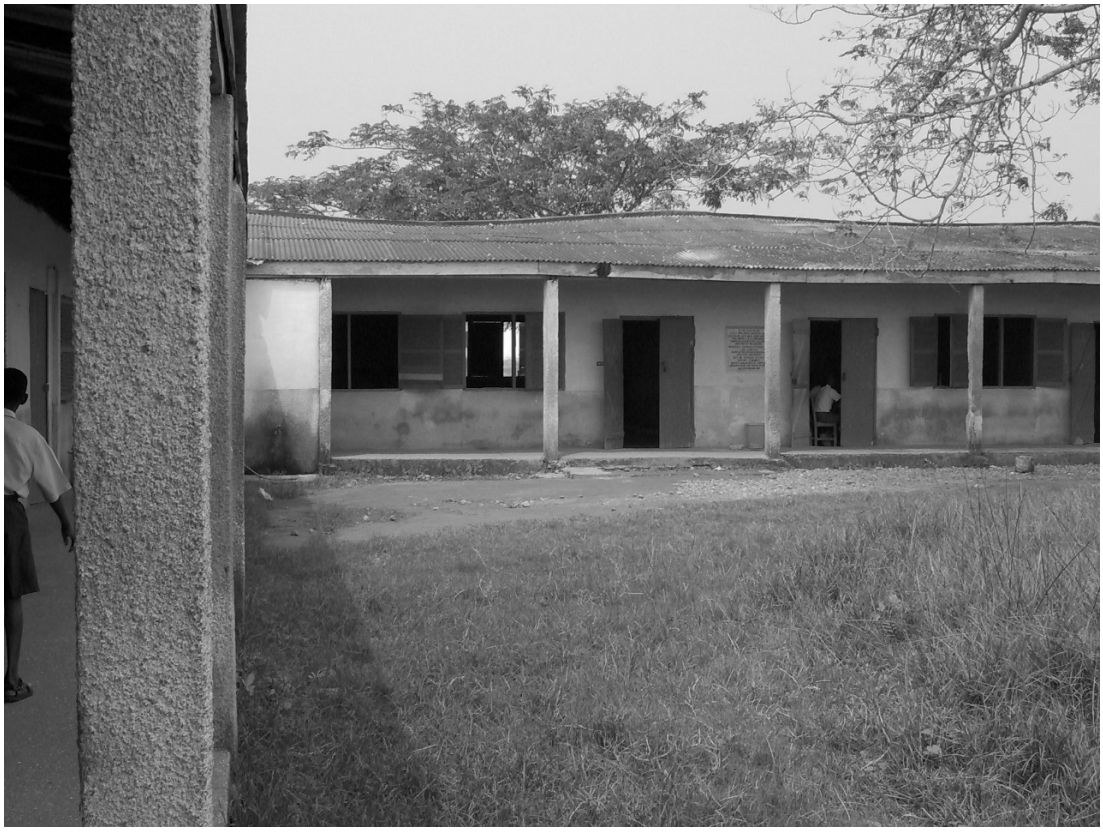

*School buildings in West Africa*

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# Preface

Educational systems in Africa during the colonial period focused on a school system that was based on the perspectives of the colonial rulers. Nearly half a century ago African leaders, after the independence granted to their countries, were expressing the high hopes of positive political and economic development in their countries. But alas, the development has been regressive. Today Africa is the only continent in the world that has become poorer in the past 25 years. There has been a gradual fall in the school enrolment rate in the African countries. Countries like Nigeria, according to a recent joint study by Nigeria's National Planning Commission and the United Nations Children's Fund (UNICEF), had 57 percent of its population over the age of 15 that could read and write in 1991. But by 1999, the figure had fallen to 49 percent.

By the year 2000, half the world's poor were in Africa compared with 10% in 1970. Vast majority of the population in the African countries, according to the World Bank, live on less than one US Dollar a day. The unemployment and underemployment rate is getting higher. So also, the standard of education has been falling due to lack of infrastructure, funds for teachers' salaries, corruption and diseases. Even though there is seemingly high rise of school enrolment, the over-stretched infrastructure and lack of good management of resources have continued to lower the standard of education. As one of the consequence there have been steady and drastic degradation of the environment and increasing abject poverty. A confounding situation in Zambia, for example, is that more than 70 percent of the population lives in poverty, the education achievement is being undermined by a shortage of teachers, according to the Global Campaign for Education. However, another source shows that 9,000 vacancies remain unfilled and that almost the same number of recently qualified teachers are also unemployed, apparently because of financial constraints that have resulted from the IMF's structural adjustment policies (South African Institute for International Affairs [SAIIA Report]) 2005.

Even those who remarked that there has been progress in the education sector in Africa nevertheless indicated the huge problems constraining the sector. Govender, for example, told the Johannesburg gathering held Dec. 2, 2004 that "… at the current slow pace of enrolment growth, Africa will not achieve UPE until at least 2150 – and even then it may not acquire the

skills it needs to truly develop". The socio-economic indicators show that African countries are not on the path of sustainable development.

Education is one of the major instruments for sustainable development if properly planned and implemented. It is of no wonder that the United Nations declared 2005 to 2015 as the Decade for Education for Sustainable Development. The declaration shows that the world, with the rapid on-going globalization and information technology, is in need of re-evaluating and overhauling the present educational policies and practices to achieve sustainable development. Many of the more economically advanced countries are regularly assessing their school curricula and making amendments to suit their development. The developing countries, especially those in Africa, are lagging behind in curricula development that could facilitate sustainable development. Without serious appraisals of the present school curricula in African countries, the continent will find it hard to be part of the information society. It is there therefore of no overstatement that Africa needs urgent researches to find the ways for re-assessing and developing school curricula for sustainable development.

This book, a series of articles written by African and European researchers, is an attempt to contribute to the scientific discussion on education for sustainable development. The authors have brought up educational issues that are important for consideration in the process of re-evaluation of school curricula for education for sustainable development and achievement of education for all. The articles focused on the educational issues in Ethiopia, Ghana and Nigeria. In some of the chapters general views of education as related to culture and value are discussed. A chapter is also dedicated for some views from experts in education for sustainable development. This is to show the attempts already being made in Europe, and possibility of learning from them to evolve curricula that are relevant to the everyday life and sustainable development in African.

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# Failing Educational Systems in Africa?

## Introduction

"We hear government officials saying children are the future leaders. "What I don't understand is why they leave many of us to waste away, without providing our schools the basic necessities." (Chudi Okonji, a student of St. Finbar's College, Nigeria in an interview in Lagos, IRIN - 12 Feb 2004).

More and more African children are having access to school but at the same time the quality of education is falling more and more drastically. This is because access to school does not ensure good standard of basic learning. Apart from that, the high annual increase in population and the inability to meet the demand for basic education seem to have jettisoned the impressive growth of schools and increase in the number of children attending school. According to the Johannesburg-based think tank, more than 40 million children of primary school age in sub-Saharan Africa are not receiving an education, (this amount to almost half the children on the continent who should be in primary school). Enrolment in secondary school in 22 countries is below 20 percent, and less than 10 percent of the workforce has completed secondary school.

The importance of education cannot be overemphasized for the sustainable development of any nation in this world. Educational systems in Africa during the colonial period focused on a school system that was based on the perspectives of the colonial rulers. Just like the Africa economies designed during the colonial period, its educational systems were also designed to suit the needs of outsiders not the needs of the African people. Nearly half a century ago immediately after independence, African leaders were expressing the high hopes of positive political and economic development in their countries. For example, as far back as 1961 African leaders

at an education conference in Addis Ababa in May, emphasized the importance of education and recognized that it was a basic factor in economic and social development (ECA/UNESCO 1961: 9, 37). Some countries even went as far as coming up with a language, for example Swahili, as lingua franca for their region, thinking that it would enhance teaching and understanding. However, statistical reality in the later part of 20th century shows that the emphasis and recognition expressed by the African leaders in the 1960s have not turned to positive socio-economic development.

After independence, especially from 1970s to 1980s, education policy makers in Africa limited themselves particularly to the problems of low enrolment rates. Many countries implemented new policies and achieved high enrolment rates during this period. However, it has now dawned on us that the gains in enrolment have been washed away by low quality of education and high drop-out rates. Many of the children have been leaving school without having the sustainable basic level of writing, reading and numeracy. Thus the high rate of illiteracy is still a common phenomenon in the African countries. These issues were strongly reflected and discussed at the World Conference on Education for All in Jomptien, Thailand in 1990, and also the World Education Forum in Dakar, Senegal in 2000. However, today school enrolment level, lack of adequate infrastructure and educational materials and also the rampaging diseases caused or aggravated by poverty and HIV in different African countries suggest that the UNESCO Education For All (EFA) target will not be met in these countries. According to BBC, "Universal primary education for all would not be provided until the year 2130 (http://www.bbc.co.uk/worldservice/specials/).

The remarks of the college student cited above show clearly that there are serious problems with the education system in countries like Nigeria. It also suggests that the wasting away of many young people in Nigeria will not make it easy for sustainable development to be achieved in the country.

This paper focuses on Nigeria which is the most human populated and one of the richest in natural resources in Africa to show some of the problems and probably the prospective of education in the continent.

## Flawed Educational System

The history of education in Africa shows that the Missions and colonial authorities created confusion with the type of education they introduced to Africa. It took a long time for the colonial rulers to introduce formal education system in the African countries. Rodney (1972) pointed out that for the first forty years of colonialism there was hardly a European-type school system. When such system started at the beginning of what we could term modern formal educational systems in Africa, the value systems and cultural relevance of education was blatantly ignored (Fafunwa 1974). It was all for the convenience of the colonial masters and the missionaries. Dr Thomas Tesse remarked on the shortcomings of the type of education established by the Missions. He stated as far back as 1922 that;

"Though educational facilities in Africa are largely credited to Missions and a really great service has been rendered by them to the Native People, many of the missions have yet to realize the full significance of education in the development of the African people […]. Others have thought of education as necessary chiefly to enable the Natives to read the Bible and to under-

stand the spirit of Christianity. The missions have failed to see how their success depends on native welfare, and have therefore been strangely indifferent to the economic value of agriculture, and little concerned with the health and morals of the people." (Phelps_Stokes Report on Education in Africa, London, 1962, 9)

Even though the colonial authorities in Africa later controlled and directed public and missions' schools up to the time African countries gained independence, the main ideas for establishing formal education, as remarked by Tesse, did not change. There were other anomalies in the system of education perpetuated by the colonial authorities. Sotonade and Raheem (2005) suggested that the colonial education in countries like Nigeria encouraged and intensified gender discrimination. It was argued that the system of education introduced by the colonial masters allow for the formal education of males and relegated females to "domestic labour" that required no formal education. In short it could be stated that the colonial school system introduced what Paulo Freire (1971) called the school teaching or education that perpetuates poverty and oppression.

Many African leaders immediately after the independence of their countries made various speeches that showed they understood the importance of education for the socio-economic development of their people (ECA/UNESCO 1961: 9, 37). However, they were not able to evolve the educational system to achieve the objectives. Within few years of independence there were civil wars that created unstable political, social and economic environment. These compounded the problems of the educational systems established and left behind by the colonial authorities. Since 1957 when Ghana attained her independence, and the early 1960s when many other African countries like Nigeria became independent, the educational systems have continued to be battered by serious problems (*National Education Forum Report*, Accra: Ghana Ministry of Education 1999 and Kalgo 2001). Even Ethiopia which was not colonized has not fared better (see Federal Democratic Republic Government of Ethiopia, Education and Training Policy, 1994).

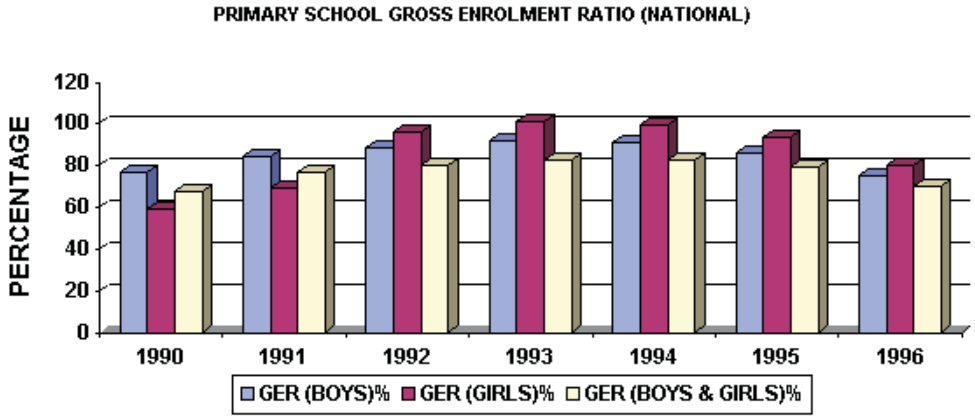
The introduction of the systems of modern schooling in Africa was also the beginning of the Africans loosing a major part of their identity. For example, local languages were made to become inferior and unusable for "official communication", learning and knowing. Vernacular speaking, as the local languages were dubbed, became forbidden in the schools by the school authorities. The subjects as planned in the curriculum reinforced the destruction of the local traditions and cultures.

Efforts were made by some of the African leaders after independence to correct some of the anomalies in the education sector, but the approaches were haphazard and did not work positively. As already mentioned above, some countries decided to uphold locally constructed language, like Swahili, as the official language. Others decided to stay with the status quo because of the difficulty in choosing a local language for the multi-ethnic countries established by the colonial masters. In some countries like Nigeria there are as many as 250 distinctly different languages. Even as time progressed schools in African countries continued to perpetuate educational policies that diminished the use and teaching of some local languages as subjects in the schools. It is nowadays very scarce to see students who are interested in learning local languages as a subject in the schools. This is not because the languages (Yoruba, Igbo, Hausa, and Twi) are not readable or writeable, but for the penchant of the African elite in using and showing that English, French and Portuguese are the languages of the privileged and progressives.

It should however, be indicated here that unlike the French and British colonial powers in Africa, the Belgians favoured mass education, in local languages, over educating an English or French-speaking elite. The Belgian method was also not successful in building up their African colonies for a sustainable education for positive development. The influence of using local languages as medium of learning in African schools has not been deeply studied but there have been more public discussions about the role of local languages in the formal schools in Africa (Michaelowa, 2001).

## Current Situation

In Africa there are still three fundamentally distinct education systems in practice. These are the indigenous system, Quranic schools, and formal European or Western-style education institutions. Of course the formal European or Western style of education is the officially approved and also the most widely practiced. However, there are still some children that still receive their education mainly through the other two systems. The steady decline of primary school enrolment rate in Nigeria (see graph below) tends to indicate that more children were out of the Western-style primary school system in 1992 than in 1996 (Federal Ministry of Education, Abuja, 30th June, 1999).




Source: Statistics Branch, Federal Ministry of Education, Abuja, 30th June, 1999.

Table 1 below shows that there is a steady decline in gross enrolment by gender and States. In the southern part of Nigeria the decline is most pronounced in States like Abia, Anambra, Cross River, Enugu and Imo. The reasons are attributed to early drop-out of boys to apprenticeship and street trading and perhaps that most of the over-aged pupils in these States are out of school, and the gross enrolment rates is almost close to net enrolment rate. In the northern part of the country low Gross Enrolment Ratio are more persistent in Bauchi, Jigawa, Kebbi, and Sokoto States. This could be attributed to the Quranic school system and street trading by children (Statistics Branch, Federal Ministry of Education, Abuja, 1999).

***Table I.*** *Primary School Gross Enrolment Rates by Gender and State*

| PRIMARY SCHOOL GROSS ENROLMENT RATE BY STATES AND GENDER (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (1992–1996) | | | | | | | | | | |
| YEAR | 1992 | | 1993 | | 1994 | | 1995 | | 1996 | |
| | M | F | M | F | M | F | M | F | M | F |
| ABIA | 115 | 107 | 102 | 113 | 110 | 108 | 96 | 93 | 64 | 62 |
| ADAMAWA | 146 | 70 | 158 | 58 | 183 | 70 | 229 | 96 | 233 | 91 |
| AKWA IBOM | 139 | 131 | 137 | 135 | 138 | 138 | 124 | 123 | 117 | 120 |
| ANAMBRA | 76 | 74 | 82 | 83 | 80 | 82 | 68 | 68 | 58 | 57 |
| BAUCHI | 44 | 28 | 50 | 33 | 49 | 11 | 56 | 38 | 55 | 39 |
| BENUE | 122 | 85 | 125 | 92 | 101 | 78 | 128 | 98 | 118 | 97 |
| BORNO | 92 | 67 | 112 | 77 | 121 | 92 | 86 | 132 | 134 | 103 |
| CROSS RIVER | 80 | 76 | 90 | 94 | 86 | 87 | 56 | 56 | 68 | 87 |
| DELTA | 109 | 106 | 126 | 119 | 100 | 112 | 76 | 84 | 73 | 81 |
| EDO | 129 | 129 | 119 | 121 | 129 | 132 | 99 | 115 | 60 | 60 |
| ENUGU | 117 | 91 | 113 | 93 | 111 | 94 | 101 | 83 | 42 | 35 |
| IMO | 124 | 107 | 120 | 102 | 116 | 103 | 100 | 97 | 68 | 61 |
| JIGAWA | 77 | 43 | 83 | 45 | 52 | 27 | 73 | 40 | 71 | 39 |
| KADUNA | 77 | 60 | 74 | 65 | 77 | 62 | 68 | 55 | 66 | 54 |
| KANO | 76 | 47 | 75 | 46 | 78 | 48 | 77 | 50 | 84 | 60 |
| KATSINA | 225 | 99 | 269 | 120 | 233 | 105 | 104 | 51 | 56 | 27 |
| KEBBI | 45 | 22 | 41 | 19 | 49 | 23 | 60 | 31 | 52 | 34 |
| KOGI | 95 | 85 | 112 | 97 | 126 | 106 | 110 | 94 | 96 | 82 |
| KWARA | 91 | 80 | 93 | 83 | 89 | 81 | 96 | 90 | 93 | 80 |
| LAGOS | 76 | 87 | 67 | 81 | 62 | 73 | 64 | 74 | 47 | 55 |
| NIGER | 66 | 42 | 81 | 55 | 86 | 59 | 92 | 61 | 77 | 47 |
| OGUN | 85 | 97 | 173 | 95 | 97 | 92 | 93 | 87 | 88 | 84 |
| ONDO | 73 | 73 | 65 | 66 | 91 | 69 | 71 | 70 | 74 | 78 |
| OSUN | 118 | 111 | 116 | 112 | 112 | 154 | 154 | 124 | 107 | 107 |
| OYO | 186 | 103 | 104 | 87 | 99 | 103 | 97 | 99 | 91 | 93 |
| PLATEAU | 100 | 78 | 104 | 83 | 112 | 91 | 110 | 89 | 114 | 93 |
| RIVERS | 60 | 65 | 59 | 65 | 56 | 64 | 59 | 67 | 50 | 56 |
| SOKOTO | 41 | 13 | 38 | 12 | 46 | 16 | 47 | 15 | 49 | 15 |
| TARABA | 109 | 65 | 116 | 73 | 122 | 73 | 143 | 109 | 139 | 106 |
| YOBE | 89 | 55 | 95 | 58 | 181 | 107 | 178 | 109 | 165 | 105 |
| ABUJA (F.C.T.) | 71 | 74 | 92 | 91 | 120 | 122 | 115 | 128 | 85 | 99 |
| NIGERIA | 91 | 75 | 95 | 77 | 94 | 77 | 88 | 74 | 75 | 65 |

Source: Statistics Branch, Federal Ministry of Education, Abuja, 30th June, 1999.

**Learning and Teaching Environment**

The classroom is probably the most important built environment for learning. It is therefore necessary to consider it in the set up of any public education system. Even with a culturally responsive curricula and state of the art technology, students need a good physical environment. A child needs a classroom atmosphere conducive for learning. The major problems facing learning environment in Africa are dilapidated school buildings, lack of libraries and functioning laboratories, overcrowded classrooms and low standard of environmental sanitation.

The schools in Africa are affected with the generally poor government social services and poverty. In many schools the classrooms are overcrowded because of the rapid increase in the enrollment of pupils. Schools are without libraries, good toilets and water. And many schools do not have enough or good chairs and tables for the students. It is not unusual for students to seat on the floor in some schools, especially those in the rural area. The architectural designs of schools in many of the African countries are faulty. The classrooms are dark especially in the raining season and hot in the dry season. From my estimation during my fieldworks in some African countries, it can be conservatively suggested that about 30% of the public schools in the urban cities are connected to electricity power, and less are functional. In the rural areas public schools connected to electricity power are very rare. The general picture of schools in Nigeria is captured in the statement of a Lagos teacher; "I can't really complain because the situation in my class is quite typical," she sighed. "In some parts of Nigeria pupils don't even have a roof over their head and have to study under trees." (IRIN News.org, LAGOS, 12 Feb 2004).

**A dilapidated Primary school**

One of the indicators of failing school systems is the very low quality of teachers and depressing teaching environment. The learning and teaching environment are the same for teachers and students. In many Nigerian schools teachers rooms are surrounded by the mouldy walls and windows that have long since lost their panes (IRIN News.org, LAGOS, 12 Feb 2004).

Teachers in the public schools are not motivated, and it is not unusual to see untrained and unqualified persons as teachers in the private schools. It has also been recorded that even secondary school dropouts teach in a private school for a salary of N500 per month (Ofume, B.S, Champion Newspaper, Wednesday April 27, 2005).

Teaching profession has become so degraded in Nigeria that the society does not respect or encourage it. Parents discourage their children from becoming professional teachers because of the low status given to them. Even teachers themselves have very low perception of themselves (Raheem & Kupari, Education for Sustainable Development; Teachers' Perspectives in the Developing Countries. Paper presented at the 11th Annual International Sustainable Development research Conference, Helsinki, Finland. 6-8 June 2005).

## Conclusion

"I do not know what is really happening in my beloved country Nigeria, the giant of Africa. I look on the streets and the hopelessness on the face of highly qualified but jobless people eats at my soul. You know it beats me that here it is becoming the norm to find whole families where virtually every member of that family is unemployed, not because they do not have qualified people in that family but they just can not get employment. Assistance to become self employed is also not available. What is really wrong? Perhaps if the cause of this malady can be identified then it can be arrested." (http://www.nairaland.com/nigeria/, 14.11.2005)

There are many serious problems with the school systems in Africa. Firstly, the issue of poverty has to be addressed. In many cases the issue is overstated because even the countries that are earning high income from their mineral resources in the continent are equally having failing or failed school systems. I prefer that mismanagement of funds should be the most important issue to address in this case. Another problem is the misplaced focus of African governments for economic development. This has increased the corruption in the African countries because the political leaders in the continent are more and more personalizing the high income generating economic activities in the name of capitalism and free market. One of the consequences of this is that the rich African elites do not care for the provision of good school systems in the continent because they can afford sending their children to expensive private school at home or abroad.

Secondly, cultural relevance of education should be considered for education for sustainable development. An educational system that encourages cultural identity and promotion of culture of peace is important for economic growth and environmental management that can promote global sustainable development.

In conclusion and addition to properly address the issues of failing educational systems, rebuilding and improving school systems in Africa, there are needs to review the school curricula for both the student-teachers and pupils. So also quality assurance and upgrading the status of teachers in the society by improving their wages and school environment should be a priority.

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# Teacher Education and the Challenge of Sustainable Development in Nigeria

## Introduction

Much of recent efforts at improving human conditions in most societies have focused on sustainable development. The United Nations (UN) gave an additional impetus to this trend by declaring the years 2005-2015 a decade of Education for Sustainable Development (ESD) on 20th of December 2002. At the core of ESD is the need to motivate, equip and involve individuals and social groups in reflecting on how people (youth and adults) live and work, to promote informed decisions as well as create ways of working towards a more sustainable world (IUCN 2003).

Education is not unexpectedly linked with the current global advocacy for sustainable development because it is a potent weapon of change and an indispensable mechanism for bringing about meaningful transformation in the behavioural and intellectual outlook of people. The socio-cultural, economic, political, scientific and technological challenges faced by nations and regions of the world in their quest for development have been resolved only to the extent to which they actualise relevant activities and programmes of education and training. The endless human quest for development itself disrupts the delicate balance of the environment (air, water and land) due to exploitation, use and abuse environmental resources, and this necessitates continuous awareness of the dangers associated with driving the environment beyond its capacity to continue to support human survival.

The recognition accorded education in awareness creation about the human environment dated back to the first United Nations Conference on Human Environment in Stockholm, Sweden, in 1972 when the concept of "Environmental Education" (EE) was coined (Ogunyemi 1994) as the precursor of ESD. Other UN-sponsored platforms such as the first inter-govern-

mental meeting on EE held in Tbilisi (1977), the "Tbilisi + 10" in Moscow (1987), the Earth Summit in Rio de Janeiro (1992) and the World Summit on Sustainable Development in Johannesburg (2002) also underscored the pre-eminent place of education. While Rio was the first to call on all countries to develop and implement an "Education for Sustainable Development Strategy", the Johannesburg conference deepened this advocacy through its conception of ESD as an investment in the future of humanity while also calling on each respective country to allocate appropriate resources to actualise national strategies for this process (IUCN 2003).

Teacher education is a critical factor in achieving both the goals of EE as well as those of ESD since they are indeed complementary. Teacher education in EE has in fact been described the "priority of priorities" (UNESCO/UNEP 1990). Any teacher in environmental education is expected to have some reasonable knowledge of all the relevant subjects (e.g. Geography, Biology and Chemistry) that make up environmental science and as well be skilful in appropriate strategies for reaching the target audience to positively influence their prevalent attitude and behaviour towards the environment (Aina 1994). Hence in-service and pre-service training of teachers is of paramount importance to the successful development and implementation of ESD in Nigeria or elsewhere in the world.

This paper therefore sets out to achieve three principal objectives; one, to examine the concept of sustainable development as related to the Nigerian context; two, to review the current goals, structure and focus of teacher education in Nigeria; and, lastly, to highlight the challenges posed by ESD for teacher education and articulate some ways of responding to the challenges.

## Sustainable Development: A Perspective

The most popular definition of sustainable development comes from the report of the World Commission on Environment and Development (WCED) which defines it as a process that "seeks to meet the needs and aspirations of the present generation without compromising the ability to meet those of the future". The definition goes further to explain sustainable development as:

> … a process in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations (WCED 1987).

Commenting on the WCED's definition, the World Conservation Union (IUCN), the United Nations Environmental Programme (UNEP) and the World Wide Fund for Nature (WWF) in their *Caring for the Earth: A Strategy for Sustainable Living* (IUCN/UNEP/WWF 1991) stress that sustainable development can only be meaningful in the context of improving the quality of human life while living within the carrying capacity of supporting ecosystems. It is increasingly being taken beyond the narrow scope dissemination of information about sustainability, through the influence of Agenda 21 of the Rio Conference and the recent World Summit on Sustainable Development at Johannesburg. The current thinking is that sustainable development is a process of adaptive management and systems thinking, requiring creativity, flexibility and critical reflection (IUCN 2003).

The imperative of concerns for sustainable development in much of the Third World (particularly Africa) resides in the scenario whereby an increasing majority of the people live in abject poverty, preventable diseases and ignorance. A clear understanding of the dynamics of the local and global ecosystems, for example, could go along way in assisting the people get the best quality of life out of their environment without compromising future needs. While such critical knowledge has been helpful in reassessing the cumulative negative effects of industrial growth and certain patterns of relationship with the environment in Europe and North America, this kind of consciousness is yet uncommon in Africa (NEST 1992).

Recognising that measures taken to achieve a healthy environmental base in other parts of the world can contribute greatly to employment, social and economic empowerment, and reduction of poverty, the New Partnership for Africa's Development (NEPAD) has targeted eight sub-themes for priority interventions in Africa. These include combating desertification, wetland conservation, invasive alien species, and coastal management. The other issues are global warming, cross-border conservation areas, environmental governance, and financing (NEPAD, 2001). Nigeria is one of the leading African nations at the forefront of the implementation of NEPAD and the Environmental Initiative.

According to the World Bank, Nigeria's most pressing environmental problems are soil degradation and loss, water contamination, deforestation, gully erosion, fisheries loss, coastal erosion, wildlife and biodiversity loss, air pollution and water hyacinth infestation in that order of importance (Akalusi 1994). In response to the challenges posed by these problems, the Nigerian government had set to implement programmes in the areas of alleviating poverty, managing demographic change and pressure (e.g. formulation of population policies in 1989 and 2003), achieving security, and preventing and reversing desertification. Other planned strategies are protecting forests and biodiversity, conserving coastal resources, assuring adequate water supply and quality, and ensuring sustainable industrial production. Recent critical reviews of these and related strategies however revealed that they were largely unimplemented (Akalusi 1994; Olajuyin 2002; Lawal 2003).

Nigeria may therefore be at the threshold of environmental crisis with the apparent failure of previous efforts at sustainable development of the country. While NEPAD, with its questionable slant for "foreign assistance", has outlined the priority issues as a continental framework for achieving sustainable development, it may end the way of earlier local initiatives unless the human values and attitude that underpin policy formulation and implementation in Africa, and particularly Nigeria, are adequately addressed.

It is in this context, in particular, that the promotion of Education for Sustainable Development (ESD) seems to readily suggest itself. ESD calls for public understanding of the principles behind sustainability, and the social process needs to be mainstreamed into all sectors including business, agriculture, tourism, natural resource management, local government and mass media, adding value to programme development and implementation. In addition, ESD is life-long learning for all, regardless of peoples' occupations and circumstances. It is relevant to all nations, be they industrialized, less industrialized or agrarian. Lastly, ESD calls for specialized training programmes to ensure that all sectors of society have skills necessary to relate to their world in a sustainable manner (IUCN 2003).

The issues involved in ESD as highlighted are no mean challenges for policy-makers in Nigeria. While they overlap with some other sectors of the national life, it is in respect of teacher

education that the challenges are perhaps most striking. Before returning to this, however, a cursory look at teacher education in the country might be helpful.

## Teaching and Teacher Education in Nigeria

Teacher education is emphasised in educational policies of countries worldwide, including Nigeria. Just as no nation can rise above the quality of its educational system, by the same token, no educational system can rise above the quality of its teachers (Federal Republic of Nigeria 1998, 33). The development of teacher education programmes in Nigeria, however, is intricately linked with the history and trajectory of formal education in the country. The Christian missionaries introduced formal education into the present-day Nigeria with the establishment of the first primary school in Badagry in 1842 and were joined much later in the business by Islamic groups.

The sole purpose of early missionary schools was to give their clients basic skills in reading, writing and arithmetic to enable them read and interpret the Bible and not for an all-round development of individuals or their society. Up till 1925 when the Phelps Stokes Commission's Report sharply condemned the education being given Africans as irrelevant and alienating, a mixture of the good and the bad, the wise and the unwise, the productive and the unproductive, the British government had no clearly defined policy on education in Nigeria or elsewhere in Africa. This, according to Fafunwa (1974), resulted in several anomalies in the educational development process including lack of uniform syllabus, standard textbooks, and regular school hours; inadequate supervision of schools; absence of a central examination system; disparity in the condition of service for teachers and teacher training; and inadequate financial support and control.

For much of the colonial era that ended in 1960, teaching profession and teacher education were not accorded their rightful place in the scheme of things in Nigeria. Whether under the missionaries (Christian and Islamic) or the colonial government, people took up teaching appointments with little or no professional competence and commitment. The major criterion for hiring teachers was a demonstrated skill in performing religious obligations. Potential teachers sought appointment only as the last resort when all other options failed and they approached the job as an opportunity for apprenticeship training that was to be discarded later (Ajibade, 1987). As the Ashby Panel which undertook a review of Nigeria's requirements in the area of higher education on the eve of the country's independence observed, "It is not so much that these below-standard teachers had no professional qualification – though quite a considerable percentage did lack such a qualification – as that they were insufficiently educated" (Ashby 1960: p.81).

Nigeria however took bold steps to revitalise its teacher education programmes as part of the post-colonial general educational reforms in the 1960s. The National Curriculum of Conference of September 1969 provided the first major platform for stock-taking and reversal of colonial legacy in the field of education in general and teacher education in particular. Nigeria's educational policy, first published in 1977, was the crowning glory of that conference. The policy has since been revised in 1981 and 1998. Otherwise called the NPE, the policy accords teacher education a centre-stage position in the planning and development of education in Nigeria (Federal Republic of Nigeria 1998).

The goals of teacher education, according to the NPE, are:

(a) producing highly motivated, conscientious and efficient classroom teachers for all levels of Nigeria's educational system;
(b) encouraging further the spirit of enquiry and creativity in teachers;
(c) providing teachers with the intellectual and professional background adequate for their assignment and making them adaptable to changing situations; and
(d) enhancing teachers' commitment to the teaching profession.

Among others, the following are institutions officially recognised to provide the required professional training of teachers, provided they continuously meet the required minimum standards:

(a) Colleges of Education – mainly for the training of NCE teachers through in-service and pre-service programmes for a period ranging from three to five years after secondary education;
(b) Faculties of Education – awarding degrees and certifications in education through in-service and pre-service programmes for a duration of between two and six years following secondary education;
(c) Institutes of Education – for the award of diplomas, certificates and degrees in education for a duration of between one and six years following secondary education;
(d) Schools of Education in the Polytechnics – mainly awarding NCE certificates following three-year post-secondary education;
(e) National Teachers' Institute – mainly awarding Teachers' Grade II and NCE certificates through part-time distance learning for varying durations of between two and five years; and
(f) Open University – formally opened in 2003 to award degrees in science and technical education through distance learning after a period of five years of post-secondary education.

In the NPE (Section 6B: 33-34), teacher education is classified under tertiary education. It specifies that the minimum qualification for entry into the teaching profession shall be the Nigeria Certificate in Education (NCE). By implication, the Grade II teachers' certificate (TC II) is to be phased out totally in the nation's school system. It is to be noted however that a large number of teachers in primary schools in particular, and especially in the northern part of the country, are still unqualified (that is, with qualifications below TC II).

By and large, the whole teacher education policy was conceived against the backdrop of the NPE's overall objective of orienting the quality of instruction at all levels of education towards respect for the worth and dignity of the individual; faith in (hu)man ability to make rational decisions; moral and spiritual principle in inter-personal and human relations; shared responsibility for the common good of society; promotion of the physical, emotional and psychological development of all learners; and acquisition of competencies necessary for self-reliance (Federal Republic of Nigeria 1998, 7). And it could be gleaned that the ideals implicit in the philosophy of Nigerian education are not only central to effective teacher education but are *sine qua non* for attaining the programme objectives of ESD.

## Challenges for Sustainable Development

It is no exaggeration to state that Nigeria's developmental aspirations devolve on teachers. Teachers are character builders and agents of change. No matter how well intentioned the educational objectives, no matter how well-packaged the school curricula, and no matter the beauty and elegance of school plants and structures, without a crop of dedicated, sound and competent teachers, the whole efforts at promoting education for achieving developmental objectives in Nigeria would come to nought. Hamilton (1956) succinctly made this point long ago when he observed:

> The system of training teachers is the keystone of any national system. In a rapidly developing country like Nigeria, the efficiency of teacher training will be the main determining factor in the success or failure of education to meet the country's needs.

The National Working Group (NWG) on the integration of Environmental Education (EE) in teacher education in Nigeria under the aegis of the Nigerian Conservation Foundation (NCF) and the World Wide Fund for Nature (WWF) at a workshop in 1996 made the same point more pungently:

> The school system is the centre for educational activities and the teacher constitutes the most important factor for the efficiency of the system. It follows therefore that in the efforts to propagate environmental awareness among the masses, the proper training of the teacher must be given central consideration (Lawal & Mohammed 1997).

The NWG further highlighted the objectives of EE in teacher education in Nigeria as:

(a) creating awareness about the environment in the trainees;
(b) equipping the trainees with knowledge, skills, and attitude that will enable them to have positive influence on their environment and the students; and
(c) serving as resource persons in schools and communities.

The NWG also identified the four thematic areas that should constitute the pillars of EE in teacher education in Nigeria as *Ecological Foundations*, *Human Environment and Developments*, *Environmental Changes and Impact*, and *Sustainable Development* (Lawal & Mohammed 1997).

It is therefore beyond contention that the ongoing regional and global aspiration for sustainable development, to which Nigeria fully subscribes, poses serious challenges for teacher education in the country. Principal among these are curricula review, training of trainers, in-service training, funding, quality assurance, and policy and general supportive environment for innovation.

### Curricula Review

Efforts at introducing EE into the Nigerian educational system crystallised in the production of a proto-type curriculum in 1992 largely through the activities of the Nigerian Conservation Foundation (NCF), the World Wide Fund for Nature (WWF) and the Nigerian Educational Research and Development Council (NERDC). The University of Calabar and the University of Nigeria, Nsukka, pioneered the integration of EE elements into teacher education and both

enjoyed the tremendous support of NCF and WWF in the early 1990s. At the University of Calabar, for example, programmes in the Postgraduate Diploma in Environmental Education (PGDEE), the Ordinary Diploma in Environmental Education and the Bachelor of Environmental Education (B.Ed/Environment) were introduced while machineries were also set in motion to organise short courses and seminars for in-service teachers, popularise Conservation Clubs in and outside the University and promote resource (books, illustrational materials, etc) development in EE (Inyang-Abia & Obi 1997; Okpala 1997). Other teacher training institutions were expected to borrow a leaf from these initial efforts and commence curricula review in teacher education for the full take-off of environmental education in the Nigerian school system.

Unfortunately, however, the curriculum initiatives at both the teacher training and school levels only recorded momentary success owing to policy discontinuity that usually characterises change of leadership in Nigeria. This development is not peculiar to EE. Reflecting on the failure of the curriculum projects sponsored within the context of Nigeria's *National Policy on Education*, Ivowi (1998, 2) observes:

> Apart from the delay in developing all the curricula, installation in the school system was commenced for most subjects without pilot testing. Some orientation workshops organised for teachers in different parts of the country for introducing the philosophy, objectives and content of the curricula to them were not replicated, as planned, at the state and local government levels to produce the multiplying effect expected. As the economy deteriorated, input into the education system became adversely affected; and in particular, instructional materials were inadequately supplied and used by both teachers and learners.

It is therefore no surprise that the curriculum review for EE in teacher education that climaxed by the 1990s in Nigeria has today been drowned by dearth of enthusiasm and focus on the part of major stakeholders. It certainly would take more concerted efforts, home and abroad, at curriculum re-engineering to get environmental education activists back on board especially with the new challenge of ESD.

**Training of Trainers**

Evidence abounds to suggest that the vast majority of teacher educators in Nigeria presently have limited knowledge that could see them through in successfully handling EE courses within teacher education (Adara 1997; Okpala 1997). Apart from limited knowledge, their pedagogical competence is sometimes in doubt because some, if not many, of them have never taught at the level of education into which they work day and night to prepare their students (Aghenta 1992). Again, Nigerian teacher trainers are reputed for traditional lecture methods of teaching which sometimes run contrary to the problem-solving orientation of environmental education, and may therefore be confronted with marrying the methodological demands of EE with the methodology which teachers find convenient in preparing student-teachers for examinations (Okpala 1997). All this underscores the need for adequate capacity building for Nigerian teacher educators in the content and methods of EE if they are to effectively perform the roles expected of them as trainers of schoolteachers and resource persons at the community level.

## Funding

It can be rightly argued that the bane of educational development in Nigeria is poor funding (Ajayi 2000). This is particularly worrisome with respect to teacher education which is regarded as the pivot of the educational system and national development. In the words of an observer of the Nigerian scene,

> The inadequacy of funding teacher education is constituting a serious problem to the successful implementation of the policy with regards to teacher education programme. Government has promised to award scholarships and bursaries (to teacher trainees) but the awards are not encouraging in terms of the number of award and the amount of the award. This financial problem is also making it difficult to expose teachers regularly to innovations in the profession. Teachers who, on their own attempt to upgrade themselves thorugh in-service training without necessary approval by the government stands the risk of dismissal though the Policy has advocated for such exposure (Fadipe, 1992: 205).

These subsisting practices surely constitute serious obstacles to the full installation of EE in teacher education in particular and the educational system as a whole. Without the needed quantum of resources, teacher educators themselves would not have access to local and foreign training opportunities in EE. Neither can they avail themselves of opportunities for further learning through modern information and communication technology (ICT) particularly the Internet. Little wonder that some of the leading non-governmental (NGOs) at the forefront of advocacy for EE in teacher education recoiled into their shells in the face of lukewarm attitude to project financing and their own highly limited budgets. It is only hoped that there would be a change of attitude now that the Nigerian government has fully identified with the NEPAD strategy for sustainable development.

## Quality Assurance

Recent commentators agree that all is not well with the quality of teacher education programmes in Nigeria (Ajayi 2000; Kalgo 2001; Umar 2002; Ayodele-Bamisaiye 2002). Day (2000) asserts that it is the creation and sustenance of the moral and professional purposes of teachers that should provide the main agenda for their continuing professional development in the 21st century. The Nigerian policy on teacher education fully supports this view in principle. However, it is another thing altogether at the level of implementation. For example, whereas the value of the B. Ed degree whether obtained through a full time course or part-time ought to be the same, shortcomings in the part-time or sandwich programme – ranging from entry qualifications to course duration vis-à-vis full time programmes – have been reported with serious implications for quality teacher education (Aghenta 1992). Again, teacher education programmes, like most other academic programmes, are marketed for fund generation in most Nigerian tertiary institutions largely because of dwindling resource provision by proprietors of the institutions (State and federal governments as well as private organisations). And in the face recent upsurge in student enrolment for teacher education, Nigerian educators are handicapped in giving their best for the pedagogical and intellectual preparation of teachers. This ugly trend, unless checked by relevant authorities, is bound to hamper Nigeria's ability to respond to the challenge of ESD presently as well as in the coming years.

**Supportive Environment**

Little or nothing can be achieved when there is no enabling environment for the steady implementation of teacher education programme or the development of the entire educational system. Political instability has given rise to haphazard implementation of policies in Nigeria. For example, while the government purportedly phased out the Teachers' Grade II colleges in 1980s, it recently returned the same cadre of teacher education facility through its Pivotal programme organised by the NTI. Again, the confusion created by the sudden introduction of a new subject area called Citizenship Education, which experts regarded as a duplication of some older school subjects like Social Studies, Government and Geography in the 1990s (Ogunyemi 1998), is yet to fissile out in the Nigerian educational system. Citizenship Education was supposedly introduced to teach the basic elements of Nigerian constitution as well as provide a platform for the teaching of EE. It is noteworthy, however, that the original idea of the initiators of EE was to infuse or integrate the core EE issues into the existing programmes whether at the teacher education or school level (Okpala 1997; Adara 1997). The Nigerian government may therefore need to insulate the educational system from the vagaries of socio-political life which adversely affect the fortunes of education if the system is to effectively respond to the challenges of the 21st century. A starting point is to empower relevant agencies and organs like the Ministries of Education at the State and Federal levels and the Nigerian Educational Research and Development Council (NERDC) with the required personnel and resources to perform their statutory roles on a sustainable basis. This requires absolute sincerity in the deployment of internal resources as well as amalgamation of resources from foreign allies who are genuinely interested in reversing the misfortune of underdevelopment in which the country has been embroidered since independence.

## Conclusion

Nigeria aspires to be among the leading nations of the world in the shortest time possible. This dream permeates all the country's national development plans since independence from Britain. But the dream may remain a forlorn hope unless the educational system, and particularly teacher education, is accorded its due attention in the day-to-day running of the country. Our analysis of the challenges posed by the emergent participatory paradigm otherwise called "sustainable development" clearly shows that teacher education is the key to Nigeria's effective participation in the global drive to improve the living, working and dwelling conditions of humanity within an intergenerational perspective. Our hypothesis is that if necessary steps are taken to review and install appropriate curricula, train the right calibre of trainers, revitalise the in-service training programmes, provide adequate funding, assure quality in the system, keep the policy in focus and facilitate a generally supportive environment for innovation, Nigeria's teacher education will in no time become the prime-mover for sustainable development in the country.

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# Teacher Education in Ghana: Theory and Practice

*"Distinctions between theory and practice are not fully meaningful since all practice is theory-driven…"*
(Bullough 1997)

## Introduction

Teacher education plays a crucial role in preparing a cadre of people to assist the greater majority of individuals to adapt to the rapidly changing social, economic and cultural environment and ensure the development of human capital required for the economic growth of societies. The capacity of teacher education to fulfil these functions depends on its ability to prepare teachers to teach in such a way as to meet the present and future demands of society. In fulfilling these functions, teacher education is guided by policies which provide theoretical justification for its operations.

The need for more teachers is accentuated by the expansion of education to meet increasing population and rising demand for education in many societies and the perception of education as a basic human right. This need has become more critical as countries implement the Education for All policies adopted at the World Declaration of Education for All in Jomtien, 1990 and the Dakar Framework for Action adopted at the World Education Forum in Senegal (UNESCO 2000).

It is generally acknowledged that improvement in the quality of education depends on improving the attraction, "recruitment, training, social status and conditions of work of teachers, who in turn need the appropriate knowledge and skills, personal characteristics, professional prospects and motivation" (Delors et al. 1996; Lo 2000) to perform their expected roles. However, teacher education programmes in many countries are not holistic; they tend to give strong emphasis to the development of knowledge and skills and give little attention to teachers' self-

reflection and their enlightenment throughout their teaching careers. A holistic teacher education programme, borrowing from Hargreaves and Fullan's (1992) three approaches to teacher development, may be perceived to involve the acquisition of knowledge and skills, development of self-understanding (of personal beliefs and knowledge about teaching), and as ecological change i.e. the development of collaborative school culture. This calls for the establishment of a strong link between pre-service and in-service teacher education (Goodlad 1994).

This presentation examines teacher education in Ghana in terms of its objective, contextual challenges, national initiatives aimed at improvement of teacher education, characteristics of teacher education and the way forward.

## Objective of Teacher Education in Ghana

The underlying principle of teacher education in Ghana is:

> *to provide teachers with better knowledge and skills, together with better incentives to use their knowledge and skills for the benefit of children, through the creation of an accessible, integrated teacher education and training system which provides a structure for continuous professional development throughout their teaching careers.* (MOE 1993)

The Presidential Committee on the Review of Education Reform in Ghana stated the objective of teacher education in Ghana as *the training and development of the right type of teacher who is competent, committed and dedicated. Such a teacher should be capable of:*

- *Applying, extending and synthesising various forms of knowledge;*
- *Developing attitudes, values and dispositions that create a conducive environment for quality teaching and learning in schools;*
- *Facilitating learning and motivating individual learners to fully realise their potential;*
- *Adequately preparing the learner to participate fully in the national development effort (Republic of Ghana 2002).*

## Policies as Directives in Teacher Education

Many national systems of education including that of Ghana regard teacher education as an instrument for the development of quality teachers for schools. As such the structure and orientation of teacher education tends to be guided by policies that aim at addressing identified professional deficiencies and bridging gaps in the knowledge and skills required by teachers to perform their tasks effectively (Lo 2000). A number of government policies have in the past directed the need for changes in teacher education.

Over the last 40 years, teacher education in Ghana has undergone a number of changes, resulting from policy changes, with the ultimate objective of producing the best teachers to meet the educational needs of the country at various times during the country's struggle to create a viable educational system. These changes have resulted in the production of different groups of teachers with different types of certificates. These include:

- 2-year Certificate 'B' (post Middle school) - to prepare middle school leavers to teach in elementary schools;

- 4-year Certificate 'A' (Post Middle school) - designed to extend the teacher preparation time of middle school leavers;
- 2-year Certificate 'A' Post B – for upgrading Certificate B teachers;
- 2-year Certificate 'A' (Post Secondary) – designed to train secondary school leavers as elementary school teachers;
- 3-year Certificate 'A' – designed to raise the standard of basic school teachers;
- 3-year Specialist Teachers for secondary schools;
- 3-year Diploma Teachers for training colleges and secondary schools;
- 1-year Post Graduate Diploma and;
- 4-year Bachelor of Education.

Many of these qualifications were introduced as an act of policy and/or with the aim of filling a gap in the teachers' knowledge and skills but were withdrawn as soon as they achieved their purposes or were found to be inadequate in preparing teachers. Those that have been phased out include 2-year Certificate 'B', the 4-year Certificate A (post middle), the 2-year Certificate A (post 'B'), the 2-year Post Secondary and the Specialist programmes.

The greatest push for qualified teachers came about with the reform of the education, from basic to tertiary education in 1987 as a result of public concerns about the quality of education, management and supervision of instruction and limited access. The reform resulted in a new structure for education – the 6-3-3-4 system, that is, 6 years primary and 3 years Junior Secondary education, which together constitute 9 years Basic education, followed by 3 years Senior Secondary education and 4 years University education. This reduced the length of pre-tertiary education from 17 years to 12 years. The reformation also involved policies on curriculum renewal, textbook development, expansion of infrastructure to increase access to basic education, improvement of the management and supervision of the educational system, improvement in in-service education and training and most importantly, teacher education. The reform introduced new subjects and programmes into the curricula at the different levels, and had a completely new orientation which was based on the development of technical and vocational skills; this therefore required the training of large numbers of teachers with different specializations.

Beside the reform, another major national policy that has resulted in the expansion of schools and the subsequent demand for teachers is the country's 1992 Constitution, which contains the basic framework for guiding education in the country. According to Article 25 of this Constitution:

- *All person shall have the right to equal educational opportunities and facilities and with a view to achieving the full realisation of that right-*
  - (a) basic education shall be free, compulsory and available to all;
  - (b) secondary education in its different forms, including technical and vocational education, shall be made generally available and accessible to all by every appropriate means, and in particular, by the progressive introduction of free education;
  - (c) higher education shall be made equally accessible to all, on the basis of capacity, by every appropriate means, and in particular, by progressive introduction of free education;
  - (d) functional literacy shall be encouraged or intensified as far as possible (Republic of Ghana 1992).

Based on these provisions, the Government has implemented measures to ensure (a) improvement of access to quality education for all children; (b) primary schools are available in every community such that children do not commute from a distance of more than 5 kilometres and, (c) the use of local language as the medium of instruction from Primary 1 to 3.

These issues as well as the country's commitment to the Dakar framework on Education for All have created the need for quantitative and qualitative improvement of teacher education.

## Contextual Challenges in Teacher Education

The most recent statistics on Ghana's educational system indicates that out of the 130,853 teachers in 2000/2001, 14.8% are pre-school teachers, 48.1% are primary school teachers, 29.4% teach at Junior Secondary Schools while 7.7% are Senior Secondary School teachers. These figures are reflective of the number of schools at each level of education. Even with these percentages, many classrooms do not have their complement of teachers. Statistics from the Ministry of Education indicate that in 2000/2001, there were 652 primary schools with one or no teacher. It is estimated that even if these schools had one stream at each class level, a total of 3,912 trained teachers will be needed to fill the vacancies. Apart from this, it is estimated that at the pre-school level additional 30,200 trained teachers and 16,700 attendants will be required (Republic of Ghana 2002).at the basic level, the Teacher Education Division (TED) of the Ghana Education Service declared 11,628 vacancies to be filled in 2002 (TED 2002).

The distribution of teachers by gender is skewed in favour of males. Apart from pre-school where females constitute the majority (94.7%), the proportion of females decreases as one moves up the educational ladder.

It is noteworthy that not all teachers in Ghana have professional teaching qualifications. At the pre-school, only 29% have professional teaching certificates. The percentage of professionally trained teachers at the primary, junior secondary and senior secondary levels are 78.8%, 87.2% and 54.2% respectively. Thus a sizeable percentage of practicing teachers especially at pre-school and senior secondary school need formal professional training.

Other challenges facing the development of teachers in the country include the following:

1. Over 10,000 teachers leave their classrooms to pursue further studies with pay every year in an unregulated way thereby creating staffing problems in the schools. This is a very expensive endeavour and the challenge is to find a way of minimizing the expense;
2. The challenge of sustaining the allowance paid to students during their initial teacher training. Annually the government spends 47.25 billion cedis (about 6 million US dollars) on study leave allowances. This comes from the meagre 2.4% of the Ministry of Education's budget that is allotted to teacher education. It seems that the poor funding of colleges of education and teacher training in particular may be a widespread phenomenon (Darling-Hammond and Goodwin 1993).
3. The challenge of attracting the best senior secondary products into teaching:
   the best students prefer to pursue degree courses in universities instead of a certificate; in addition, unlike their peers who can obtain a degree in four years from a university after secondary, it takes a longer period (about 9 years) for someone who has gone through post secondary teacher training college to get a first degree. The poor status of teachers in the society is causing many training colleges to enrol below their capacity. In addition, the fact that teacher training colleges are not considered as tertiary institutions does contribute to low level of enrolment.

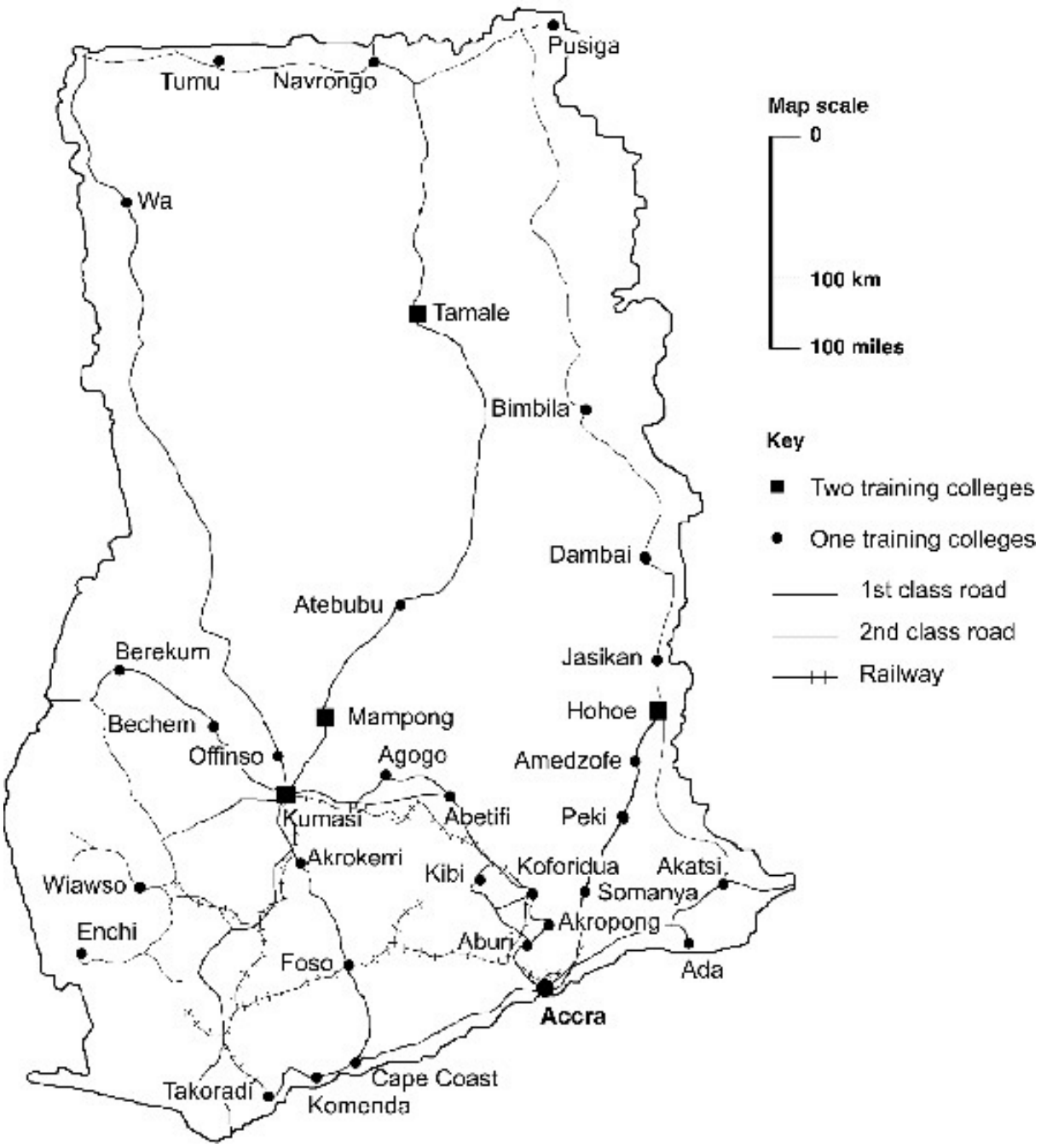
4. Teacher training colleges produce about 6,500 Certificate A teachers annually;
5. Courses of study at the TTCs are not aligned to those offered in the universities;
6. There is disconnection between theory as taught in teacher education institutions and practice on the field; that is, the needs of the schools including their teachers are not matched to the curriculum of teacher training institutions.
7. Teacher education does not seem to influence the 'native theories' of pre-service teachers; the native theories they enter training colleges with remain untouched (Bullough 1997, p. 105).
8. Teachers are poorly motivated and suffer from what is described as 'chronic prestige deprivation' even though they are expected to develop the future leaders needed for economic and social development.
9. Indiscipline among teachers is on the increase; there are reports of drug abuse, rape, use of school children as child labourers and absenteeism among teachers in the schools;
10. Flows out from the teaching service – high rate of teachers leaving the service due to poor conditions of service. In the year 2000, about 2000 teachers were lost through retirement, vacation of posts, secondment, etc.
11. Flight from basic to senior secondary teaching - upgraded teachers from the basic schools tend to seek teaching appointments in the senior secondary schools, thus creating 'classrooms without teachers'.
12. There is dearth of teachers in mathematics, science and vocational and technical subjects at the junior and secondary school levels as well as in the technical and vocational institutes.

## Structure of Teacher Education

Teacher education or development as is used by many teacher educators (Hargreaves & Fullan, 1992) is a complex, multi-faceted process, made up of initial teacher training, in-service training (or continuing education) and lifelong education. In some places, teachers go through an additional process of induction and licensing. These processes cannot be carried out in isolation from one another. A strong synergistic relationship among the different elements is required for quality teacher education.

Currently, the major institutions that collaborate to provide teacher education in Ghana are: Ghana Education Service (GES), University of Education, Winneba (UEW), and University of Cape Coast (UCC). The Ghana Education Service provides initial teacher education through 38 Teacher Training Colleges located in various parts of the country (Figure 1).

**Training Colleges in Ghana**




**Pre-Service Teacher Training**

Initial or pre-service teacher education for basic school teachers has for a long time been the preserve of Teacher Training Colleges under the Teacher Education Division of the Ghana Education Service. Thirteen out of the 38 colleges are mandated to train junior secondary school teachers while the remaining 25 train primary school teachers. The curriculum consists of one and a half year subject content teaching, one year of methodology and about half year of teaching practice. A recent review of the system indicated that there was an over emphasis of meth-

odology at the expense of content, and weak performance in mathematics, English language and science (Government of Ghana, 2002). Because of the poor grades of students, the first year is used to justify students' continuation in the programme. Training of teachers for secondary schools and teacher training colleges was initially delegated to the University of Cape Coast which was set up as a teacher training institution in the 1960s to produce graduate teachers, at a time when the country was embarking on a massive expansion of secondary education, and to diploma-awarding specialist colleges set up to train teachers of science, mathematics, technical education, agriculture, home economics, physical education, music, art and special education for the secondary and teacher training levels. With the change in the focus of UCC from a teacher training university to a comprehensive university offering other programmes apart from teacher education, the University of Education, Winneba was established through the amalgamation of the specialist diploma-awarding colleges to provide teacher education for all pre-tertiary education institutions including non-formal education, as well as upgrade the qualifications of practicing teachers at these levels.

**In-service Teacher Training**

The training of teachers for the basic level is now not the preserve of TTCs as both UCC and UEW offer initial training as well as in-service upgrading programmes for teachers with certificate A and Diploma qualifications. UCC has a primary education department that trains teachers for primary schools while UEW has a basic education department that offers programmes for the training of primary and junior secondary school teachers. Continuing education takes place at the universities. The upgrading of teachers at the basic level is carried out using the dual mode of delivery; that is, the conventional or traditional face to face approach and the distance education mode. While some teachers are granted study leave with pay to pursue first degree programmes on the campuses of the universities, others who for various reasons remain in the classroom enrol in distance education programmes offered by the two institutions. At the moment there are over 90,000 certificates A teachers who need to be upgraded to at least the diploma in teaching level. This stems from government policy which requires all teachers in basic schools to hold a diploma qualification by the year 2005 (MOE, 1998).

The GES is responsible for the conduct of school-based or cluster-based in-service education and training courses in the country. However, these in-service courses are rarely organized and invariably when it happens it is with funding from development partners. In this age of increasing information, this does not help the teacher to keep up to date with developments in his/her subject area.

**Initiatives in Teacher Education**

The teacher education scene in Ghana has experienced a number of developments and initiatives. These include the following:

- A move away from relying on pre-service training as the only model of teacher education to a more comprehensive paradigm of teacher education that embraces pre-service training, in-service education for upgrading as well as skill development and continuing professional self learning (lifelong learning) (Table 1). These aspects are coordinated to make teacher education and training a career long activity.

***Table I.*** *The Different Aspects of Teacher Education*

| Aspects of teacher education | Location | Implementing agencies | Duration | Structure | Mode | Qualification |
|---|---|---|---|---|---|---|
| Pre-service or initial teacher education | T.T.C | GES/TED | 3yrs | IN-IN-OUT | Traditional/ DE | Certificate A |
| | Univ. | universities | 4yrs | Traditional/ IN-IN-IN-OUT | Traditional/ DE | BEd |
| Induction? | Schools? | GES? | NA* | NA | NA | Teaching License? |
| In-service-upgrading | UCC; UEW | Universities | 1,3,4yrs | Traditional, in-in-in-out | Traditional/ DE | Diploma BEd |
| In-service-cluster school | School cluster | GES | Variable | variable | Traditional | NA |
| In-service – lifelong learning | Individual | Individuals | lifelong | variable | variable | NA |

*NA means not applicable

- Recent policy changes have allowed private participation in the provision of initial teacher education in the country to produce Certificate A teachers; five colleges have so far been registered.
- The curriculum of the TTCs have been re-structured into the IN-IN-OUT-IN system, which consist of 2-year academic work in the college and 1/2-year practicum experience in the schools and ½ year theoretical work in the College. A mentoring system and distance education has been integrated into the OUT segment of the programme.
- Strengthening linkages between TTCs and Universities to ensure better articulation of programmes (MOE 2001).
- Introduction of District Assemblies' sponsorship of student teachers to TTCs.
- Widening accessibility to initial teacher training for untrained teachers through access courses.
- Introduction of national competitive entrance examination to select from the pool of qualified candidates.

## Characteristics of Teacher Education Offered by the Three Agencies

Apart from the Teacher Training Colleges which offer one programme for basic teaching qualification, the universities have a number of programmes which are designed to meet the different entry qualifications of the students as well as the needs of the educational system (Table 2). Although the orientation of teacher education is to produce quality teachers for the schools, the different providers place emphasis in different areas. For example, UEW concentrates on upgrading and production of technical/vocational teachers while UCC produces teachers for secondary schools as well as heads for these schools. All the teacher training colleges including the private ones receive academic and professional supervision from UCC. According to Lo

(2000), the involvement of the universities in teacher education is a welcome phenomenon as it ensures that teachers have a firmer grounding in subject content knowledge.

The practical training that students undergo and the characteristics they develop in their teacher education programmes are determined to a large extent by the type of "model and method of teacher education" (Ben-Peretz 2000). Ben-Peretz (1996) identifies two models - the master teacher model and the Joint problem-solving model. A third model used in Ghana is the college or university supervision model which gives the university or college supervisor the sole responsibility for shaping the thoughts and practices of the student teacher. Although this could be considered as a master teacher model, an attempt has been made to differentiate it from that at the school level. In this model schools are used as authentic sites for student teachers to practice what they have been taught in the college or university without any assistance from the teachers in the school. Indeed the teachers in the schools perceive the period of student teachers' practice teaching as a time to have a break. In the master teacher or apprenticeship model, significant individuals such as method lecturers, school-based mentors serve as personal models of professional practice through their knowledge, actions and attitudes. For the joint problem-solving model, student teachers, teacher educators and mentors participate jointly in solving real-life school and classroom problems, the solutions to which are not known to any of them. The UCC uses the university supervision model, while UEW uses a cross between the master and the joint problem-solving models. Teacher training colleges are transiting from college supervision to school mentor-based master teacher model.

The introduction of the 4-year IN-IN- IN-OUT programme at UEW was an innovation introduced to meet the need for quality education in the schools. With this, the students spend 3 years doing academic work in the university and use the last year for internship in schools across the country. This new system extends the 4-week teaching practice to 40 weeks. It involves the following innovative strategies:

- Introduction of **mentoring system** and the formation of **Professional Development Schools** (PDS) for professional teacher education through university-schools partnerships.
- Introduction of **Portfolio** as an appraisal system as well as the basis for reflection during the practicum experience.
- Engagement of student teachers in developing their **philosophies of teaching**; this is intended to challenge pre-service teachers to engage in the exploration of their beliefs and expectations or what may be termed their 'native theories'.
- Introduction of **action research** as a tool for engaging in reflection on their 'native theories' as well as the problems they encounter in their teaching. It allows pre-service teachers to bring their private and public theories into the public domain. Action research allows the teachers to systematically codify their practical experience and make it part of the shared professional knowledge of teachers just as is done by many recognised professions such as engineering and medicine (Ben-Peretz 1984).
- Involvement in **school community activities** such as Parent-Teacher association activities.

Another important development is the use of distance learning in the training of teachers in the three institutions. At UCC and UEW, diploma in education programmes by distance learn-

ing through the use of print media is offered to practicing teachers; the UEW has in addition, a post-diploma distance learning programme. In contrast, at the TTCs, distance learning has been built into the school-based practicum to enable students cover some content areas.

The problem of lack of science and mathematics teachers in the schools has led both UCC and UEW, to institute remedial teaching and pre-entry programmes respectively for candidates with weak grades in science and mathematics subjects in the senior secondary school examination. This has helped in increasing participation of students in these subjects since those with best grades in science and mathematics prefer to pursue programmes other than teacher education ones.

Table 2 gives the characteristics of the teacher education programmes at UEW, the University of Cape Coast and Teacher Training Colleges.

***Table 2.*** *Comparison of the Nature of Teacher Education in Approved Institutions*

| AREAS | Teacher Training Colleges | University of Cape Coast | University of Education, Winneba |
|---|---|---|---|
| **Emphasis** | Concern for quality of education at the basic level | Produce teachers and heads for secondary and teacher training colleges | Concern for upgrading teachers in order to improve basic, secondary and technical education |
| **Implementors** | TED/GES | Faculty of Education | Entire UEW |
| **Type of training** | Initial | Initial/Upgrading | Mainly Upgrading |
| **Duration of programme** | 3 years | 2 years/4 years | 2 years/4 years |
| **Structure/Location** | Concurrent;<br>(i)2yr college plus 1yr school-based practice coupled with DE * | Concurrent/Consecutive;<br>(i)4yr university with 6weeks of school-based practice<br>(ii)2yr sandwich diploma<br>(iii)2yr DE<br>(iv)1yr PGDE<br>(v)1-2yr Med/MPhil | Concurrent/Consecutive<br>(i) 3yr university; 1yr internship in schools<br>(ii) 2yr DE<br>(iii) 2yr post Dip DE<br>(iv)1yr sandwich/ full time CE**<br>(v)1 yr PGDE<br>(vi)1- 2yr Med/MPhil |
| **Model of practical training** | College supervision | Master teacher/ University supervision | Master teacher/joint problem solving |
| **Levels** | Primary/JSS | Primary/JSS/SSS/TTC | Primary/JSS/SSS/TTC |
| **Entry requirement** | 12yr of schooling with SSS grades | (i)12yr of schooling with SSS grades;<br>(ii)Post sec Certificate A;<br>(iii)BA; BSc.<br>(iv)Science remedial | (i) Post Sec Certificate A; (ii)HND;<br>(iii)BA,BSc; (iv)Dip. in Education<br>(v)12yr of schooling with SSS grades;<br>(vi)10 weeks pre-entry programme |
| **Qualification** | Certificate A | BEd; Diploma in Education | BEd; Diploma in Education; Post Diploma; CE |
| **Quality assurance** | UCC | UCC/NAB | UEW/NAB |

*DE = Distance Education; NAB= National Accreditation Board
**CE = Certificate in Education

## The Way Forward

A cursory look at the historical evolution of teacher education in Ghana points to the element of change as one of the hallmarks of teacher education in the country. The sub-sector has over the years witnessed a number of initiatives, structures and programmes in an attempt to improve the system.

The current challenge is to make teacher education more efficient and responsive to the constantly changing needs of the Ghanaian society and to take into account evolving knowledge about learning and development processes. It is stated that the quality of human capital of any nation depends upon the quality of education it offers, and the quality of education given is also determined by the quality of teachers who teach (Republic of Ghana 2002) while the quality of teachers is also dependent on the quality of teacher education. Measures to improve the quality of teacher education and the continuing development of the teacher are therefore critical to a nation's progress.

- Teacher education should not be perceived as a one-shot exercise but as part of a process consisting of initial teacher education, continuing education and lifelong education.
- Improve the implementation of the OUT segment of the IN-IN-OUT structure of teacher training through formation of partnership schools and proper orientation of head teachers, mentors, students and remuneration of mentors and link coordinators.
- To increase their attraction, the present initial Teacher Training Colleges (TTCs) should be converted into Colleges of Education to award Diploma certificates as recommended in 1995 as the minimum qualification for teaching at the basic schools without further delay. These colleges should be affiliated to UCC and UEW for academic and professional supervision.
- A National Teaching Council (NTC) should be set up as an advisory body to be responsible for the professional development of teachers.
- An induction/probation year should be institute as an integral part of teacher development.
  (a) The need to provide support for the beginning teacher has become more urgent than before because of the selection of teacher education as a last resort.

  (b) Strategies should be outlined for the proper induction of beginning teachers into the profession.

  (c) After creditable performance during ITT, the teacher should be awarded the appropriate qualification by the institution and a Provisional Teacher's License (PTL) by the National Teaching Council.

  (d) A team of assessors working from the NTC shall recommend that the teacher be issued with Professional Teacher's License after a year's probation, which shall grant the person the status of a professional teacher. This license shall be subject to renewal every 5 years.

- The building of assessment portfolios should be encouraged by the Ministry of Education for purposes of promotion and license renewal.
- INSET programmes should be tied to promotion and renewal of license. There should be a systematic procedure to consolidate in-service courses into programmes that offer appropriate qualifications to participants.
- District sponsorship of teacher training college students by District Assemblies should be encouraged and strengthened. This will ensure the participation of districts in the posting of new teachers into needy rural schools.
- To ensure that higher qualifications would not sent teachers away from the basic level, a career path should be created for primary teachers, pre-school teachers and secondary school teachers.
- To encourage more teachers to enrol on the distance education programme, the Ministry of Education should pay the full cost of tuition, cost of modules and travelling expenses of the teachers. Web-based distance and open learning courses should be promoted to support the print media.
- Use web-based distance learning to train teachers for the technical areas. The university will soon be piloting an adapted version of a technical teacher training distance education programme in partnership with Commonwealth of Learning.
- To increase the number of technical teachers, HND holders from the polytechnics should be encouraged to pursue professional teacher training.
- Teacher education should be made attractive to the best products from the secondary schools.
- More female students should be attracted to the Initial Teacher Training Colleges. Currently the ratio is skewed toward male students.
- Sandwich programmes should be mounted to cater for both the non-certificated as well as untrained teachers.

## Conclusion

The role of teacher education in the production of human capital for Ghana is very well acknowledged. Some researchers (eg. Goodlad 1990) have painted a bleak picture of teacher education. However, for teacher education to fulfil its role, the link between theory and practice, the needs of the school and the curriculum of the training institution, pre-service and in-service teacher education, and the balance between methodology and subject content need to be taken seriously. It is believed that the introduction of the partnership development schools, mentoring system, a longer practice in the school, portfolio, reflective practice and action research at the University of Education, Winneba will go a long way in helping to address these issues.

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# Ethiopian School Curriculum and its Relevance for Every Day Life: A Study on General Secondary (Grade 9 & 10) Curriculum

## General Background

### Country and People

**Geography.** Ethiopia is in the east of Africa (Horn of Africa), located between latitudes three to the eighteen degrees north and longitude thirty-three to forty eight degrees east, covering a total area of some 1,112,000 square kilometres. It is roughly the size of France and Spain combined. The country is bordered by Somalia to its east, Kenya to the south, Eritrea to the north, Sudan from northwest to west and Djibouti to the northeast. Ethiopia with an abundance of water, fertile soil, and untapped mineral wealth, is a country of vast potential and one that is bent on establishing a secure, viable economic and legal environment. About 65% of the land is arable and 15% presently cultivated. If these potentials are well exploited, the totality of life situation including educational provisions will be improved.

**Climate**. Altitude inside Ethiopia ranges from about 100 meters below to about 4000 meters above see level. The climate varies, with average temperature ranging from 15 degrees centigrade at the high altitudes to 40 degrees centigrade at sea level. There are two seasons: the dry seasons prevail from October through May, while the wet season prevails from June to September. Its proximity to the equator and greater altitude range create climates varying from continental cold to tropical.

**The People and the Culture.** The Population of Ethiopia, in 2003, is estimated to be 69,127,000 persons of which 50.13 (34,653,000 are male where as 49.87% (34,474,000) are female, and growing at 3% annually. 29,306,000 (50.20%) male and 29,076,000 (49.80%) female, totally 58, 382,000 (85%) people live in rural area where as only 5, 347,000 (49.76%) male and 5, 398,000,(50.24%) totally 10,745000 (15%) people live in urban areas. The age distribution showed that 45.4 per cent are less than 15 years of age. The proportion of the population in the age group 15-64 years is 51.4 %. Only 3.2 per cent were over 65, (Central Statistic Authority (CSA 2003). The average number of inhabitants per square kilometre is 49.

The people of Ethiopia are multi-ethnic, multi-cultural, multilingual. There are over 83 different languages with 200 dialects spoken in different regions. Amharic, with its unique alphabet, is the official language; however, other languages such as Afan Oromo, Tigrigna, Guragigna, Kembatigna, Somaligna, Hadiyigna, Arabic and English are widely spoken. Different regions have their own language, which they use for official work and as a medium of instruction to the children of elementary schools, with some exceptions. So far 19, languages are used in classrooms and some are still being developed (MOE 1998). The religious composition of Ethiopia is 50.6 % Orthodox Christians, 32.8 % Muslims, 10.2 % Protestants, and 4.6 % followers of traditional religions the remaining 1.8 % other religions CSA (1998).

**The Economy**. About 90% of the Ethiopian population earn their living from the land, mainly as farmers. Agriculture is the backbone of the national economy and the principal exports from this sector are coffee, oil seeds, pulses, flowers, sugar, vegetables, cattle on the hoof and hides and skins. The Ethiopian Economy suffers from lack of technological know-how, absence of developed infrastructure facilities, rapid population growth, soil erosion, recurrent drought and famine, and unfavourable external terms of trade, resulting in shortage of foreign exchange. Most affected is the agricultural sector, which is the mainstay of the rural people. This economic backwardness affected the life situation of the people of Ethiopia in general, where education is a hope to alleviate the problems.

**Education.** Education and training constitute an important part of the capacity building and human resource development strategy of any nation. The education sector of Ethiopia has been facing very serious problems and constraints in meeting this goal. Some of these are: low participation rates, an implementation of curriculum divorced from the existing reality, uneven distribution and inadequate utilization of educational inputs, lack of equitable access to schooling for many rural inhabitants, in general and female children and children with special needs in particular. Shortage of qualified teachers and inadequate budget have also been major problems.

Due to these problems, the actual participation rate, from pre school through tertiary level is very low in comparison with many African countries. Recent data from the Ministry of Education (Annual Abstract 2002/03) indicates the following gross participation rates of children and adolescent: kindergarten (age 4-6) about 123,057 (*2%*) out of 6,068,196 children; primary education (age 7-14) grade 1 through 8 is 8743,265 (*64.4*%), out of 13,577,335; secondary education (age 15-18), grade 9 and 10 is 586,309 (19.3%), out of 3,044861 adolescents. The gender gap is increasing as students move from primary to secondary. From the Gross Enrolment Rate of 64.4% in the primary school, percentage of male is 74.6 and female 53.8%; in secondary (9-10) from 19.3% General Enrolment Rate, 24% are males while only 14.3% are females. On the other hand the Net Enrolment Rate is 52.2% from which 45.2% for girls and

59.0% for boys, in primary schools. The education policy, strategies and programs are addressing the problems of access, equity, quality and relevance in education.

**Education and Training Policy**

Education is a process by which man help to explore and/or share his experiences, new findings, and values accumulated over the years, in his struggle for survival and development, through generations, to bring productive and good citizenship. Education enables individuals and society to make all-rounded participation in the development process by acquiring knowledge, ability, skills and attitudes (ETP 1994).

Ethiopian education in the past (before 1994) was surrounded with multifaceted problems. Although the Ethiopian modern education during the last hundred years has contributed to the countries holistic development, it could help much in tackling poverty, the poverty that became an identity of the nation. As described by a document of ICDR (2003), the curriculum before 1994, is characterized with the following limitations:

- Didn't help the country to free from poverty, starvation and backwards.
- It couldn't able students love and create work rather than expecting job from Government.
- Schools were not centre for producing good citizenship.
- Education was not equally access to all citizen.
- There was big disparity between rural and urban and between female and male.
- The participation rate was very low, about 20%.
- Education and training of teacher lacked quality.
- The education system was dominated by theory; teachers centred, and lacked practice and quality at all.

These and many other factors were the causes for the emergence of the first and the new education policy of 1994.

As it has been indicated in the Ethiopian Education and Training Policy (ETP 1994), one of the aims of Ethiopian education is to strengthen the individual's and society's problem-solving capacity, ability and culture starting from basic education and at all levels. Education must help human being to identify harmful traditions and replace them by useful ones. It helps man to improve, change, as well as develop and conserve his environment for the purpose of an all-rounded development by diffusing science and technology into the society, through research practices for sustainable development. Education also plays a role in the promotion of respect for human rights and democratic values, creating the condition for equality, mutual understanding and cooperation among people.

However there are enormous efforts and improvements, Ethiopian education is entangled with complex problems of relevance, quality, accessibility and equity. The objectives of education seem to take cognizance of the society's needs and do adequately indicate future direction. But still there is a need to amend contents and mode of presentation that can develop student's knowledge, cognitive abilities and behavioral change by level, to adequately enrich problem-solving ability and attitude. Inadequate facilities, insufficient training of teachers, overcrowded classes, shortage of books and other teaching materials, all indicate the low quality of edu-

cation provided (ICDR 2004). The necessary infrastructure to provide relevant quality education to the rural population, which is over eighty-five percent of the population of the country, is at an insignificant level of development.

The policy emphasizes the development of problem-solving capacity and culture in the content of education, curriculum structure and approach, focusing on the acquisition of scientific knowledge and practicum. Along with this, it directs that there be appropriate nexus between education, training, research and development through coordinated participation among the relevant organizations (ETP 1994). The policy incorporates the structure of education in relation to the development of student profile, educational measurement and evaluation, media of instruction and language teaching at various levels, the recruitment, training, methodology, organization, professional ethics and career development of teachers. Due attention is also given to the provision and appropriate usage of educational facility, technology, materials, environment, organization and management so as to strengthen the teaching-learning process and the expansion of education. Overall, the education and training policy envisages bringing-up citizens endowed with humane outlook, countrywide responsibility and democratic values having developed the necessary productive, creative and appreciative capacity in order to participate fruitfully in development and the utilization of resources and the environment at large.

In relation to the structure, the Ethiopian Education is structured in three general phases:

- General education includes kindergarten to grade 10; in which primary education is eight years (grade 1-8) and general secondary is only two years (grade 9 &10).
- Technical and Vocational Education and Training (TVET) includes: non formal basic vocational training, Junior level TVET and Middle level TVET.
- Higher Education which departs from upper secondary education, i.e., after grade 10 and include under graduate and graduate levels.

Hence, the main objective of general secondary education (grade 9 & 10) is to provide students for TVET and higher education. As stated in the Policy documents of Ministry of Education (2002, 20), *"In the first cycle of secondary education (9$^{th}$ to 10$^{th}$ grade), students will acquire useful academic knowledge that will prepare the to enroll either in various vocational training programs or preparatory programs for university level education within a short period. Thus, no time or resource will be wasted".*

*General Objectives of Ethiopian Education and Training*

1. Develop the physical and mental potential and the problem-solving capacity of individuals by expanding education and in particular by providing basic education for all.
2. Bring up citizens who can take care of and utilize resources wisely, who are trained in various skills, by raising the private and social benefits of education.
3. Bring up citizens who respect human rights, stand for the well-being of people, as well as for equality, justice and peace, endowed with democratic culture and discipline.
4. Bring up citizen who differentiate harmful practices from useful ones who seek and stand for truth, appreciate aesthetics and show positive attitude towards the development and dissemination of science and technology in society.

5. Cultivate the cognitive, creative, productive and appreciative potential of citizens by appropriately relating education to environment and societal needs.

**The goals and profile of students who have completed the 1st cycle secondary education (Grade 9 and 10)**

From the Documents of Institute of Curriculum Development and Research (ICDR, 1994) the goal and profile education for grade 9 and 10 are the following.

Goals

1. To provide a graded general education that will enable the students to identify their need, interest and potential so that they can choose their field of study, TVET or Higher education
2. To enable the students to continues further education and training
3. To prepare citizens who can be involved in the production sector with advanced vocational training

Profiles

1. They can work in areas that do not require special skills or training as they are mature mentally and physically
2. They are ready for advanced vocational training owing to their acquisition of general knowledge in which theory is linked with practice
3. They are conscious of their civic responsibility and they are ready to fight against social ills and mal practices
4. They are ready for on the job training
5. They can actively participate in different activities such as social meetings, discussions, community development activities
6. They are ready to acquire practical and theoretical knowledge through continuing education

To effect the objectives and profiles mentioned above the curriculum for grade 9 and 10 includes: 1. Language (English, Amharic and Nationality language); 2. Mathematics; 3. Natural Science (Physics, Chemistry and Biology) 4. Social Sciences (Civics, Geography and History).

Hence, the main Objective of this Study is to explore whether the curriculum designed has helped to achieve the objectives and profiles mentioned and related to daily life of the learners.

## Methods and Procedures of the Study

**Research Design**

The intention of this study was to collect empirical data specific to the grade 9 and 10 curriculum relevancy to daily life of the learners. In order to meet this purpose, a qualitative study design was employed to investigate a contemporary phenomenon within its real life context of the curriculum development and implementation in which multiple sources of evidence are used.

**Sampling**

The sampling procedure for this study was purposive sampling. The students, the teachers and the experts at Institute of Curriculum Development and Research (ICDR) were purposefully sampled. This study was concerned only with twelve students, subject teachers in three high schools in Addis Ababa City Administration and Senior experts at ICDR.

**Instruments**

To obtain adequate information for the study a multiple-method (triangulation) approach was used. These multiple methods include interviews, document reviews, focus group discussions and informal talks. The documents and semi-structured interviews were the main data collection instrument. Informal talks and focus group discussions were supplementary data collection methods.

*Semi-structured Interviews*

The interviews were conducted with senior experts at ICDR and subject teachers in the three schools using semi structured interview guides. The interviews that were done in vocal language with experts and teachers were collected by written recordings.

*Reviewing documents*

Education policies, development policies and strategies of government, syllabus, and text books of grade 9 and 10, different document on summary of curriculum evaluation and documented community opinions were reviewed.

*Informal Method*

The informal talks were conducted with few experts at ICDR and few teachers, to verify some issues gathered through interviews.

*Focus Group Discussion*

Focus group discussions were conducted with 8 students in each schools at the end of data gathering processes. The focus was on general Impressions students on the relevancy of the curriculum to their daily life. The aim was to strengthen the findings obtained from informants through the other methods conducted in this study.

## Procedures in Organising and Analysing Qualitative Data

The interviews conducted with teachers and experts and informal talks, and focus group discussion with the students in the Amharic language were transcribed from the log book and translated into English. The transcription and translation were carried out all the time, immediately after data were collected and before the next data collection day. Then information collected through multiple methods from multiple participants was categorized, reduced, displayed, verified and analyzed in words. The data reduction, data display and verification as interwoven before, during and after data collection in parallel form, make up the analysis. This was very important for the fieldwork cycle back and forth between thinking about the existing data and generating strategy for collecting new, often better data. This had energized the proc-

ess of fieldwork. The experiences of the researcher are also used in organizing the data. Finally, the analyzed data was systematically reorganized and presented. Due to space all the data are not displayed and described in this article. Only the summary of the main findings are condensed, clustered and abstracted, precisely and clearly presented and discussed in the following part.

## Discussion of the Main Findings

### Curriculum in English Language

To participate fully in the society and workplace of the twenty-first century, today's students need to be able to use language skillfully, confidently, and flexibly. The English curriculum offers a challenging program of good quality, one that recognizes the central importance of language and literature in learning and everyday life and prepares students for the literacy demands they will face as Ethiopians and members of the global community. Equally important, it seems to encourage students to develop a lifelong love of reading and writing.

It is clear that language is the basis for thinking, communicating, and learning. Students who are preparing for postsecondary education must develop these skills in order to succeed in the challenging academic work of college and university programs. Students who are preparing for careers in business and industry also need these skills in order to adapt to a workplace that is constantly changing. Whatever their postsecondary destination, all students need the ability to express themselves clearly and effectively. Learning to communicate with clarity and precision, both orally and in writing, will help students to thrive in their future endeavors in the world beyond the school. Through the study of English language, students strengthen their own ability to use language as an effective tool for thought, expression, and communication in their learning and world of work.

In Ethiopian high schools and higher education English language is an essential tool for learning across the curriculum. In science and technology, students must communicate effectively to record observations, describe investigations, and present their findings in oral and written reports. They must also learn to use a range of technical terms and specialized language. In history, they debate interpretations of important past events. In community studies, students can conduct an interview, and in mathematics they can clarify a difficult concept by explaining it to a peer. Facility in English language helps students to learn in all subject areas; at the same time, by using language for a broad range of purposes students increase their ability to communicate with precision and to understand how language works. Subject matter from any course in English can be combined with subject matter from one or more courses in other disciplines to create an interdisciplinary course. The curriculum seems to be prepared to fulfill all the intentions mentioned above.

However, as reported by the teachers, the students and the community members, students entering Grade 9 are not fluent, and independent readers in English. It is obvious that the secondary school curriculum requires students to consider increasingly abstract concepts and to use language structures that are more complex than in earlier grades. However the English language teaching and learning program seems to be not helping the students learn to read efficiently and to absorb information quickly (ICDR 2004). The study of literature is not enough

in the English curriculum for many reasons. If it had been offered to the students, it would have helped them to expand their intellectual horizons and to extend and strengthen their literacy skills. As revealed by many scholars as a creative representation of life and experience, literature raises important questions about the human condition, now and in the past. It helps to increase their knowledge of accomplished writers and literary works and vicariously experience times, events, cultures, and values different from their own. The study of literature also helps to deepen their understanding of the many dimensions of human thought and human experience.

Many teachers suggest that students, need to read literatures that nourish the imagination, promote intellectual growth, contribute to a sense of aesthetic appreciation, and provide a broad range of language models for their own writing. Literary works enrich students' understanding of themes and issues and enhance their appreciation of the power and beauty of language. From the findings of this research it is indicated that provisions that help students become confident, proficient, flexible readers, are not available in the school system. Except academic textbooks, a range of informational texts in English, such as, technical manuals, newspapers and magazines, reference materials, memos, bulletin-board notices and CD room reading do not exist in the schools.

The other challenges are on the writing skills. It is a must that students have to use writing to record information and ideas, to express themselves, to communicate with others for various purposes, and to reflect and learn. In personal, academic, and workplace situations, students need to be able to write clearly and coherently. Unfortunately, to develop these competencies, they do not have opportunities to exercise writing daily for a variety of purposes and audiences. As the teachers indicated essays, reports, short stories, poetry, scripts, journals, letters, biographies, children's stories, articles, reviews, explanations, instructions, notes, procedures, and advertisements are related to daily life of the learners. However, there is no intentions for students to do so, as reported by the student respondents themselves. This seems that students do not have skill or are not encouraged to write frequently for pleasure and personal purposes.

Oral language is a fundamental means for communicating with others and the cornerstone of learning in all subjects, which is the other challenge of high school students in Ethiopia. One of grade ten teachers said *"Students listen partially the classroom lecture and speak poorly with poor understand of concepts. Solving problems, providing information and expressing thoughts in English are profound problems for many students in grade 9 and 10".* As many scholars in language development confirm exercises in conversation helps to improve their ability to explore and communicate ideas in both classroom and formal speaking situations. In general students are not provided and encouraged to appreciate and take pleasure in the power and beauty of language. Knowledge of vocabulary does not help students improve their reading, writing, and speaking skills. Hence, it may possible to say the practical teaching of English do not match well to the daily life of the students in grade 9 and 10, although the curriculum prepared relevant, to fulfill the intended objectives of education as stated in the policy. It seems then, the profile in the English language application of their language skills to work-related situations, to exploring educational and career options, and to become self-directed learners is not fully met in grade 9 and 10. Students at this level do lack to communicate effectively and correctly in a variety of situations, and lacked to perform a variety of tasks, as confirmed by

many teachers, in this study. Furthermore, students' intention is found to be exam oriented, rather than focusing skills that help them in every day life

**Curriculum in Mathematics**

As emphasized in the policy (ETP 1994) students require the ability to use technology effectively and the skills for processing large amounts of quantitative information. Today's mathematics curriculum must prepare students for daily life and their tomorrows. It must equip them with essential mathematical knowledge and skills; with skills of reasoning, problem solving, and communication; and, most importantly, with the ability and the incentive to continue learning on their own (Barnet, A. Raymond and Ziegler, R. Michael 1989). The Ethiopian school curriculum seems to provide a framework for accomplishing these goals.

The development of sophisticated yet easily used calculators and computers could change the role of procedure and technique in mathematics. In the other part of the world operations that have been an essential part of a procedures-focused curriculum for decades can now be accomplished quickly and effectively using technology, so that students can now solve problems that were previously too time consuming to attempt, and can focus on underlying concepts. However, the Ethiopian curriculum does not yet integrate appropriate technologies into the learning and doing of mathematics.

Mathematical knowledge becomes meaningful and powerful in application. The Ethiopian curriculum for grade 9 and 10 does not embed the learning of mathematics in the solving of problems based on real-life situations. Other disciplines should be a ready source of effective contexts for the study of mathematics. Rich problem-solving situations seems to be not drawn from closely related disciplines, such as computer science, physics, or technology, as well as from subjects historically thought of as distant from mathematics, such as geography or art. It would have been important that these links between disciplines be carefully explored, analyzed, and discussed to emphasize for students the pervasiveness of mathematical knowledge and mathematical thinking in all subject areas. The implementation of the current curriculum does not a classroom environment in which students are called upon to explain their reasoning in writing, or orally to the teacher, to the class, or to other students in a group. Instead, it seems to emphasize the use of mathematical knowledge for further education. From the discussions conducted with teachers, the efforts on the part of the teachers to promote students' understanding of the role of mathematics in daily life and its relation to career opportunities by exploring applications of concepts, providing opportunities for career-related project work, and promoting independent investigations seem to be not satisfactory. Besides, the curriculum itself does not prepare, integrating the applications across the subjects mentioned above.

**Curriculum in Natural Sciences**

Science and its impact on our lives will continue to grow as we enter the twenty-first century. Nowadays, scientific literacy for all has become the goal of science education throughout the world. As indicated by Waren (1988) possession of the scientific knowledge, skills, and habits of mind required to thrive in the science-based world is the most important aspects for daily life.

As indicated above the science for grade 9 and 10 in Ethiopia has been designed for students intending to go on to two streams: technical and vocational and higher education. Science has significant, though varied, connections with many other disciplines. Science is related in many ways to the economies of all developed nations. It is critical, to sustainable development. Thus, science cannot be taught in isolation, but must be linked to other disciplines. Topics in mathematics and technological education must overlap with topics covered in science (Cromer, 1982). Similar links also must exist with geography and other areas of social studies in order to meet the daily life of individuals. Communication is, of course, extremely important in science, as it is in all disciplines – both in terms of reading and writing, and in the use of information technology for collecting, organizing, and expressing information in Ethiopia. The newer aspects of the science curriculum of grade 9 and 10 do not focus on technology, society, and the environment. Its application does not call for students to deal with the impacts of science on society. As indicated by student informants science in grade 9 and 10 seem to be viewed as merely a matter of "facts"; rather, a subject in which students learn to weigh the complex combinations of fact and value that developments in science and technology have given rise to in modern society. In actual observations, triad of knowledge, skills, and the ability to relate science to technology, society, and the environment is very unsatisfactory, as revealed by this study. Instead, as pointed by teachers as well as students, science teaching & learning seems to prepare students for knowledge that help them to pass the national examinations.

The overall aim of the secondary science program is to ensure scientific literacy for every secondary school graduate. This aim can be achieved by meeting three overall goals for every student. The secondary science program, from Grade 9 and 10, is designed to promote these goals to understand the basic concepts of science; to develop the skills, strategies, and habits of mind required for scientific inquiry; to relate science to technology, society, and the environment. However, understanding the concepts is the most dominant rather than its applications to every day life of the learner. On the other parts of the world, ongoing scientific discoveries, coupled with rapidly evolving technologies, have resulted in an exciting environment in which creativity and innovation thrive, bringing about new career opportunities. Today's employers seek candidates with strong critical-thinking and problem-solving skills and the ability to work cooperatively in a team environment – traits that are developed through participation in the science program.

**Curriculum in Social Sciences**

The study of history fulfils a fundamental human desire to know about our past. It also appeals to us because of our love of stories – and history consists of stories. Through the narrative of history we hear and see the people, events, emotions, struggles, and challenges that produced the present and that will shape the future. The better we understand history, the easier it becomes to understand other times and places. Such knowledge teaches us that our particular accomplishments and problems are not unique – an important lesson in a world in which the forces of globalization are drawing people of different cultures closer together. Ethiopian and world studies offer students a variety of history courses that will enhance their knowledge of and appreciation for the history of their country and different parts of the world.

The history course in grade 9 and 10 explores the Ethiopian external developments and participation in global events and traces our development as a country through changes in

population, economy, and technology. Students learn the elements that constitute Ethiopian identity, learn the stories of both individuals and communities, and study the evolution of political and social structures. Students learn about differing interpretations of the past, and will come to understand the importance in historical studies of chronology and cause-and-effect relationships. The difficulty is with actual practical learning. Students do not learn to develop and support a thesis, conduct research and analysis, and effectively communicate the results of their inquiries.

The teaching and learning is mainly based on narration of past events that are related to individuals and nations. The actual teaching emphasizes little on issues related to developments such as the impact of technological developments that help to enhance the inspiration of the individuals. The data from all the participants of this study shows that the curriculum includes how and why developments in transportation and communication technology (e.g., cars, airplanes, telephone, radio) affected life since the twentieth century in the other parts of the world and in Ethiopia. Issues such as how and why changing economic conditions and patterns through human history have negatively affected Ethiopians, is not emphasized. How and why the Ethiopian economy declined for many decades. Issue related to historic roots of economic disparity between the African nations and other parts of the world their success of policies in the development is not well emphasized in the curriculum, which has direct relations with the daily life of the individual learners. As indicated by even in the usual learning of history, the students are not active in using school and public libraries, resource centers, museums, historic sites, and community and government resources effectively to gather information on Ethiopian history.

On the other hand, the contents of geography in grade 9 and 10 focus on patterns of spatial organization, including land use, population distribution, and ecosystem, regional diversity of Ethiopian natural systems such as natural vegetation, climate zones and factors that affect natural and human systems in Ethiopia. Major concepts include an understanding of the characteristics of natural systems (e.g., climate, landforms, soils, natural vegetation, wildlife) and how natural and human systems interact within ecosystem. The characteristics of human systems like, transportation, population, communication, energy networks, industry...etc. and the characteristics of urban and rural environments (e.g., population density, land use, forms of settlement, development patterns) are the content of both grade 9 and 10 (ICDR 1998). The geographical requirements that determine the location of businesses, industries, and transportation systems, and make predictions about future locations of these enterprises and systems are not well addressed.

Even though the contents seem to be well done, however, this study revealed that their implementations are not accompanied by practical development. As confirmed by both students and teachers, most teaching and learning is dominated by the teachers' traditional way of teaching. Students do not have opportunities to deal with minor learning experiences such as current statistical data on population density to identify trends and variations. Applying the knowledge for the benefit of development is the most missing part of learning. Both teachers and students have no plan to use knowledge of the local bioregion to conduct manageable research, for example the research that evaluates the effect of government land use policy on planning in the local community. Students informed that they do not contribute to the quality of life in their home, local bioregion, province, nation, and the world.

In Ethiopia, the social problem is very sever, but students in both grade 9 and 10 has never made recommendations for appropriate forms of human systems like transportation, social services, political structures, and resource management. Furthermore, evaluating the value of natural resources, including agricultural lands, solar, wind and implementing conservation strategies are far away from day to day practical learning of the students. Efforts are little or none on application of the knowledge in ecological restoration of local woodlots or schoolyards, industrial initiatives to reduce pollution.

Even though it is addressed in the curriculum, the practical learning of the human environment-interactions have not given emphasis in these grade levels. The ways in which natural systems interact with human systems, and then make predictions about the outcomes of these interactions is not explored by practical activities in relation to the learners' daily life. Understanding of the challenges associated with achieving resource sustainability, and explains the implications of meeting or not meeting those challenges for future resource use in Ethiopia and its connection with the global world is more of theoretically acquired. **Practical understanding and managing change of natural and human system over time and from place to place is the missing part of the geography lessons in grade 9 and 10,** such as changes in land use and rural patterns, as well as resource depletion, in order to plan for the future. Understanding of selected contemporary factors that cause change in human and natural systems for example technological change, corporate and government policies, natural hazards... etc are not well emphasized in every day classroom interactions.

Civics and Ethical education is the other aspects of curriculum development in Ethiopia. The course in civics explores what it means to be an informed, participating citizen in a democratic society. Students will learn about the elements of democracy and the meaning of democratic citizenship in local, national, and global contexts. In addition, students will learn about social change, examine decision-making processes in Ethiopia, explore their own and others' beliefs and perspectives on civics questions, and learn how to think and act critically and creatively about public issues (MOE 2003). This course is relatively new and revised more relevant to the nations problems. The revised curriculum is implemented as of September 2003. The new civics curriculum helps to create purposeful and active citizenship. The major contents of the curriculum are focused on values underlying democratic citizenship, and explain how these values guide citizens' actions; personal sense of civic identity and purpose, and understand the diversity of values of other individuals and groups in Ethiopian society; the challenges of governing communities or societies in which diverse value systems, multiple perspectives, and differing civic purposes coexist. It emphasizes the active participation of the learners in research and learning. Furthermore it is intended to change the citizen to participate in group enquiries and community activities; demonstrate a positive climate in group settings (e.g., respect rights and opinions of others, accept personal responsibility for group duties, provide leadership when appropriate, encourage others to participate); communicate their own beliefs, points of view, and informed judgments, and effectively use appropriate discussion skills (e.g., persuasion, negotiation); demonstrate an ability to work collaboratively and productively with others when researching civics topics in their community. Hence, if the actual teaching is well performed at the school level, the civics education can bring outstanding result, since it is addressing the realistic and everyday life of the Ethiopian people. In general, due to lack of practical experiences, discussions, debates, research, and reflection in the classroom, it is revealed that social

science courses do not help students much to become self-motivated problem-solvers, equipped with the knowledge and skills necessary to successfully face their changing world.

**Health and Physical Education**

The Ethiopian health and physical education curriculum has been designed to provide learning experiences that will help students realize their potential in life. Students will develop (ICDR 2003):

- an understanding of the importance of physical fitness, health, and well-being and the factors that contribute to them;
- a personal commitment to daily vigorous physical activity and positive health behaviors;
- the skills and knowledge they require to participate in physical activities throughout their lives.

The general objectives outlined in the curriculum concentrate on the development of personal fitness, competence, skills, attitudes, and knowledge that will help students deal with the variety of personal, social, and workplace demands in their lives. As stated by senior expert at Institute for Curriculum Development and Research (ICDR), the primary focus of this curriculum is on helping students develop a commitment and a positive attitude to lifelong healthy active living and the capacity to live satisfying, productive lives.

Healthy active living benefits both individuals and society in many ways: for example, by increasing productivity, improving morale, decreasing absenteeism, reducing health-care costs, and heightening personal satisfaction. Other benefits include improved psychological well-being, physical capacity, self-esteem, and the ability to cope with stress. This practical, balanced approach will help students to move successfully beyond secondary school.

The health and physical education courses in Grades 9 and 10 are made up of physical activity, active living, healthy living, and living skills. It is believed that the curriculum may help, students to develop the knowledge, skills, and attitudes needed to enjoy a healthy lifestyle and to build a commitment to lifelong participation in physical activity. The focus on positive, responsible personal and social behavior in physical activity settings encourages students to make safe and wise choices. According to the expert of ICDR, it encouraged pursuing physical activities outside the school program for fun, personal fitness, and health. In the living skills component of these courses, students will learn and apply decision-making, conflict resolution, and social skills.

The active participation component of health and physical education provides an excellent vehicle to address the interpersonal and work-related skills required to succeed in a given career. Students will develop coping skills and feelings of personal accomplishment. Employability skills (e.g., problem solving, goal setting, demonstrating self-esteem) are addressed directly in this curriculum. The promotion of these skills is an integral part of every strand within the curriculum and will assist students as they move into further education and/or the workplace. However, with all these qualities and objectives of health and physical education curriculum, the implementation at the school, starting from primary school through secondary level is discouraging. The attitude on the part of school administration, students and teachers of other disciplines is not favorable. From the discussions with the teachers and the students, it seems

the profiles set for grade 9 and 10 have not been well-achieved, due to weak implementations and other contributing unrevealed factors, in this study.

### Education for Students with special needs

In planning curriculum in all disciplines, teachers lacked skills and knowledge to recognize that students with special needs might require focused and specialized directions, as well as advance instruction and additional practice in the use of equipment. The use of specialized equipment and learning aids such as Braille, magnification aids, voice-activated computers, the use of alternative texts at a suitable reading level audiotapes, and specialized computer programs, as well as the assistance of oral or sign language interpreters or scribes are not accessible to students with special needs.

Health and physical education at school level cannot provide students with special needs with opportunities to enhance their understanding of personal capabilities, challenges, and potential. Appropriate modifications are not available to enhance motor skills, motivate participation, improve self-worth, and provide physical and therapeutic benefits. Participation in health and physical education provides a unique vehicle for students with special needs to develop the skills, knowledge, and attitudes that promote lifelong healthy active living. These adaptations would have included:

- equipment adaptations that enable all students to perform to their full potential;
- program adaptations to promote integration and safety (e.g., altering the method of instruction, using alternative facilities, modifying the rules and guidelines of physical activities);
- assessment and evaluation strategies that accommodate a variety of learning styles and needs;
- encouraging as much student participation as possible in planning, instruction, assessment, and evaluation.

In general, Students with special needs couldn't benefit from the well-developed curriculum and couldn't acquire self- knowledge, develop effective learning and personal management skills, getting along with others. Exploring career/life opportunities, and building competencies that prepare students to deal effectively with change and lifelong learning sadly absent for students with special needs. Students with special needs most often excused from the course, however there is a material how to help so

## Factors Affecting the Implementation of the Curriculum in Relevance to Daily Life

### Quality of Teachers

As repeatedly discussed in this paper, one of the factors affecting the quality of education in Ethiopia is determined by the quality of teachers. A Task Force on Teacher Education appointed by Ministry of Education carried out an extensive study and produced a series of reports under the title "The Quality and Effectiveness of Teacher Education in Ethiopia: A Report of the Study

Findings with Recommendations for Action". So also Addis Ababa City Administration Education Bureau, Oromiya REB and the Ethiopian Teachers' Association (ETA) carried out another study on teachers' professional ethics (MOE 2002).

A series of meetings involving teachers from all over the country offered comments, which reinforced the findings of the above studies. The major points arising out of these studies were:

- The professional competence of teachers is deficient
- The content knowledge of teachers is unsatisfactory
- The teaching skills and techniques are very basic traditional and poor
- Teachers do not match up to the standards and expectations of their profession
- There are failures in school management and administration including lack of knowledge of the Education and Training Policy and proper implementation of the career structure
- There is a mismatch between Teacher Education and school education
- There is a lack of professionalism, and ethical values in the Teacher Education programme
- The quality of courses and methods of teaching are theoretical and teacher centered
- The Practicum receives inadequate emphasis and is inefficiently implemented at all levels of Teachers Education
- Student assessment does not adequately identify difficulties and potential in order to enhance students' learning, and
- Action research is given little or no attention at all levels of Teacher Education and TEIs, schools and communities have insufficient links between them in order to implement the curriculum in a way to be relevant to the daily life of the individual learners.

In trying to address the serious problems present in the education system, the Ethiopian Government has called for a complete Teacher Education System Overhaul (TESO). In response to a study conducted into 'The Quality and Effectiveness of the Teacher Education System in Ethiopia, a paradigm shift however, requires more. It implies change in what is valued in society, and what knowledge society thinks should be learned in schools. Currently Ethiopia is striving to accommodate the development of all ethnic groups. Teachers are essentially agents for positive societal change. Those adhering to the shift in educational paradigm (that knowledge for example, depends on interpretation) can very effectively work to empower communities that endure a lack of opportunities. (MOE 2003).

**Traditional Teaching and Learning Methods**

The ability to work both independently and collaboratively is integral to success in both the workplace and postsecondary education and is equally relevant in the context of family and community. It is therefore important for students to have opportunities to develop their knowledge and skills independently, in pairs, in small groups, and as a class. Students must be able to demonstrate that they have acquired the specified knowledge and skills. Collaborative work is useful to achieve some of these objectives and has inherent value in teaching students to take on a variety of roles within a team. However, as teacher and student informants reflected, most learning is not through activities that present stimulating ideas, issues, and themes that are meaningful to students. Due to several practical problems such as lack of capacity and over-

crowded classrooms, teachers do not select classroom activities that are based on a continuous assessment of students' individual needs, proven learning theory, and best practices. Instead, teachers prefer traditional way of teaching, i.e., lecture method, in which the students are passive that does not help much to retain knowledge for longer periods and to develop meaningful skills. If they had learned through active learning strategies they would have been able to apply their knowledge and skills to real-life issues and situations.

Fieldworks, cooperative small-group learning, role-playing, simulations, brainstorming, creating scenarios for decision making, independent research, personal reflection, seminar presentations and creative dialogue are not performed in the process of school teaching and learning. Furthermore, the education seems to be not relating learning to daily life, promoting the acquisition of knowledge, foster positive attitudes towards learning, and encouraging students to become lifelong learners. Strong linkages to the community outside the school are also essential to the delivery of an effective curriculum. They can best learn about active and responsible citizenship by making contributions to their schools and communities. Their personal, interpersonal, and learning development can be enhanced and supported through connections with community service agencies, postsecondary institutions, and the broader community. As indicated by a study, apart from poor teaching methods and large class size, learning is also negatively affected by lack of sufficient text books and teachers guides, and poor English back ground of students (Belainesh and Judy in ICDR 2002)

**Lack of Technology Education**

It is clear that technological innovation influences all areas of life, from the actions of individuals to those of nations. It addresses basic human needs and provides the tools and processes for the exploration of both the known and the unknown world.

The power of technology, its pervasiveness, and its continual advances demand a rigorous curriculum and the commitment of educators to understand it, promote its responsible use, and enable students to become problem solvers who are self- sufficient, entrepreneurial, and technologically literate. Students must acquire the technological skills and knowledge required to participate in a competitive, global economy. They must become critical and innovative thinkers, able to question, understand, and respond to the implications of technological innovation, as well as to find solutions and develop products.

In Ethiopian grade 9 and 10 there is no provisions of technological education that focuses on developing students' ability to work creatively and competently with technologies that are central to their lives. Technological education is vital to promote the integration of learning across subject disciplines. For example, in designing a technological tool, students may gain information about its intended use (social science), about the materials used in its construction (science), about mathematical relationships describing its dimensions and shape (mathematics), and about the aesthetic qualities of its design (the arts); they may also create text that outlines procedures for the tool's use (language). Similarly, technology supports students' work in other subjects. It develops research skills, supports development in literacy and mathematics, and fosters creativity, critical thinking, and problem solving. In addition, it promotes global citizenship and environmental awareness.

Technological education contributes to learning in other areas of the curriculum by providing practical contexts and applications for the knowledge and skills acquired. For example, the

technological education program relates to science in that students use scientific principles to design buildings and machines, and to history and social sciences in those students assess the impact of the introduction of technologies on historical events. Technological education relies on English and literacy skills for the description of specifications, proposals, and evaluations, and has ties to the arts through its use of various media to model and present ideas and products. Technological education is also to consider the options provided by various technologies as they affect health and physical well-being. The connection to business studies is evident in the application of business principles to the study of the production and marketing of products in technological education.

The technologies grouped under technological education are connected in a number of ways. Each is based on expectations that are organized in identical strands to ensure consistency and rigor in instruction and to enable teachers to integrate the components of various courses. For example, transportation is a vital consideration in courses dealing with construction, manufacturing and fabrication, travel and tourism, and personal services. Similarly, knowledge and skills from computer and information science and computer engineering technology can be readily integrated into other courses in technological education. Unfortunately, with all these advantages and life requirements, technological education at primary as well as the secondary level (grade 9 and 10) does not exist at all, in the curriculum.

**Lack of Guidance and Career Education**

Theoretically, guidance and career education plays a central role in the secondary school by preparing students for a complex and changing world. They learn how to assess their own competencies, characteristics, and aspirations. They explore a broad range of work, learning, and community-life options, acquire an understanding of the changing nature of work and workplaces, and gain insights into the challenges and opportunities offered by the modern economy. They set goals for postsecondary education and work, and develop knowledge and skills needed to achieve their goals. At the same time, they develop employability skills that will help them find or create work and succeed on the job. The program prepares students for a changing world by demonstrating that a career is not just an occupational destination but rather a lifelong journey that includes varied and changing work, family, and community roles. It also shows them how to recognize and create opportunities, make informed choices, and pursue their personal and career goals more effectively.

In Ethiopian high schools, there is one-man guidance and counseling service, but misunderstood its mission. As revealed by this research the guidance and counseling doesn't support students to become more confident, motivated, and effective learners. The students do not develop learning and employability skills and strategies that they can use both in their secondary and postsecondary studies and in the workplace. Setting goals for education/training after high school and learn techniques that will help them manage their learning throughout their lives is not provided. There is no guidance and career curriculum that help to prepare students to live, work, and participate in a complex and diverse society. They may learn the knowledge and skills required for effective communication, teamwork, and leadership in other subjects like civics. They may also have opportunities to practice many of these skills, and others such as conflict resolution and peer support, in school and community contexts and to become aware of the importance of contributing to their communities, in ethical and civics education.

Many teachers believe that through the guidance and career education program, students learn to manage the transitions they will encounter throughout their lives, beginning with their next major transition, from secondary school to postsecondary education/training and work. The course would have prepared the students for a world that will demand adaptability and resourcefulness by developing the personal knowledge and skills they will need to navigate the future confidently and effectively.

All disciplines in the secondary school share some responsibility for students' interpersonal, learning, and career growth, and for developing the related knowledge and skills. However, the emphasis given by each subject teachers is little or none, as the participants of this study indicated. Students seem to be not relating what they are learning throughout their secondary school program to their personal aspirations and interests and to possible work and life roles. Students are not benefited by seeing the connections between what they are learning in their subjects and what is significant in their own lives. Awareness of these connections would have increased the personal relevance of the curriculum and improves motivation for all students.

The learning and thinking skills and strategies are not effective on the part of the learners. Effective use of study and test preparation strategies effective use of note-taking strategies; effective use of focus and memory strategies ability to manage their own learning through the use of study skills, organizational skills, time management, stress management, information management and, understanding are not taught to students at all level. Variety of possible internal and external barriers to learning and determine how these barriers may have affected their learning is ignored at all. Furthermore, strategies for overcoming internal and external barriers to learning; produce and evaluate learning plans that identify learning strengths, barriers, needs, goals, and strategies for success in high school and incorporate them into their annual education plans are not treated well.

Students lacked the knowledge and skills needed for working effectively in groups or teams; use interpersonal and teamwork skills effectively in learning environments; demonstrate an understanding of why, when, and how to utilize available school and community resources to support their learning needs. It is also found that the students are not encouraged to identify school and community resources available to support learning and explain how and when to access them. They also fail to use effective communication skills to gather information and request assistance for their learning needs from peers, teachers, and/or school and community programs; and are not aware how individual learning can be enhanced through community-based learning experiences. The major focus and important in the lives of the students is preparing themselves for the national examinations. Since the emphasis given to guidance and career education is little or none, it could be difficult for the students to explore postsecondary learning options, prepare themselves for community-based learning, and build the capabilities needed for managing work and life transitions. Students may not be able to design action plans for pursuing their goals.

**Lack of Resources**

Most schools have serious financial constraints and as a result equipped with very poor facilities, such as lack of classrooms, play grounds, libraries, laboratories and lack of audio-visual centers. Lack of qualified teacher for the level is also another constraints to implement the

curriculum effectively. Due to scarcity of the resources, the number of students per class ranges from 70 to 100, especially in Addis Ababa and big cities. This hampered the effective implementation of the curriculum.

## Current Trends in Education and Training

### Technical-Vocational Educations and Training

As explained in this article the main objective of general secondary education (grade 9 & 10) is to provide students for TVET and higher education. As stated in the Policy document of Ministry of Education (2002, 20), "In the first cycle of secondary education ($9^{th}$ to $10^{th}$ grade), students will acquire useful academic knowledge that will prepare them to enroll either in various technical and vocational training programs or preparatory programs for university level education in which both programs prepare students for the world of work.

Ethiopia is one of the poorest countries in the world, which is a paradox for a country with rich natural potential. As the participants of this study agreed, although education reform of 1994 is better in comparison to our previous experiences, still there are many aspects missing in the curriculum development. The new curriculum at grade 9 and 10 does not give any emphasis for realistic business activities as early as possible for their daily life, although there are TVET programs for their future life. As a result the grade 9 and 10 graduates do not have effective business education that could help them to escape from poverty. This study revealed that beyond the traditional experiences, enormous number of students does not have any awareness how businesses can generate wealth, jobs, and incomes, and how they can influence standards of living. As the teachers in this study responded the students could not distinguish the various ways in which business activity can affect the quality of life and they do not know issues in their community that have been created or affected by business. Confirming these limitations, one of the grade 10 students said, "I have never thought the impact that business activity has on the changes occurring in my community". The students believe success in business is not through education, instead they believe that the success is given to a group of a given community.

With all these limitations at grade 9 & 10, however, the Ethiopian Education Policy (1994) gives special attention for Technical-Vocational Education and Training (TVET). The new organization of Technical-vocation Education and Training is based analysis of the training needs of the country's economic and social development. Presently, Technical- Vocational Education and Training is divided into training for agriculture, health, teaching, industry, commercial and service training (MOE 2002). The TVET strategy includes basic level description outlining the target work environment, the scope of responsibility in the work place, as well as some initial indication of the expected competence at the different qualification levels (See table below).

| Level of TVET | Description |
|---|---|
| Basic Level Vocational Training | This is a non-formal training for those who completes grade between 4 and 8 and can not continue their education due to drop out and other preseason. The training provides performance of basic skills making living competencies to improve the basic needs condition and farming work in rural areas. |
| Junior Level Technical and Vocational | Performance of pre-vocational competencies in a selected occupational area on an initial stage to carry out simple work processes, for those who complete or dropout grade 8, 9 and dropout from grade 10. |
| Middle Level Technical and Vocational Level- I | Performance of basic vocational/entrepreneurial competencies in a selected occupation to carry out a variety of work activities (production work, operation and maintenance of relatively complex equipment) within a routine work process particular under supervision |
| Middle Level Technical and Vocational Level -II. | Performance of intermediate technical and vocational/ entrepreneurial competencies in a selected occupation to carryout a variety of work activities (production work, operation and maintenance of relatively complex equipment/ system) within a non-routine work process required considerable autonomy |
| Middle Level Technical and Vocational Level -III. | Performance of advanced technical and vocational/ entrepreneurial competencies in a selected occupation to carryout advanced skilled work activities (analysis, evaluation, operation and maintenance of complex equipment/ systems and workshop organization) within a non-routine work process required autonomy and particular guidance of others |

**Source**: Ministry of Education of Ethiopia 2003

## Teacher Education System Overhaul

In trying to address the serious problems present in the education system, the Ethiopian Government has called for a complete Teacher Education System Overhaul (TESO). In response to a study conducted into 'The Quality and Effectiveness of the Teacher Education System in Ethiopia', the Ministry of Education has produced a Framework detailing strategies for the overhaul. There are currently five sub-committees engaged in ensuring that the implementation of change occurs successfully. These are Pre-service, In-service, Teacher Educators, Selection, and the Education System. The sub-committees, through a shared vision, will work in close collaboration to guarantee the successful transformation of the Ethiopian Educational system (MOE 2003).

This vision presents a 'paradigm shift'. It conceptualizes the basic ideas of knowledge and learning first introduced in the Education and Training Policy of Ethiopia (1994). Rote, passive learning has been replaced with a commitment to active, learner-focused education. This requires a Teacher Education System that develops higher order thinking skills in graduates.

A paradigm shift however, requires more. It implies change in what is valued in society, and what knowledge society thinks should be learned in schools. Currently Ethiopia is striving to accommodate the development of all nations and nationalities. Teachers are essentially agents for positive societal change. Those adhering to the shift in educational paradigm (that knowl-

edge for example, depends on interpretation) can very effectively work to empower communities that endure a lack of opportunities.

In the context of Teacher Education in Ethiopia, the paradigm shift involves (MOE 2003):

- teaching which makes changes – in ideas and directly in peoples' lives,
- taking the real world into the classroom and taking teachers out into the real world, and
- democratizing Teacher Education – giving teachers, students and citizens confidence to make decisions and take initiative, to take control of their world.

The role of the Teacher Education Institutes (TEIs) within society is a crucially important one - they are in a central position to make changes and to spread new ideas or to change some of the harmful or out-dated ones within communities. It is therefore within TEIs that the paradigm shift must begin. The present proposals for the overhaul of the education system offer a direct challenge to TEIs – to redefine their role and to become active agents for change within the classroom, within their communities and ultimately, within Ethiopian society.

It is with respect to this that the objectives of Teacher Education programmes must be directly relevant to the realities of Ethiopia. This means that graduate teachers will not only be adequately prepared for the classroom, but will also be prepared to contribute to the development of the society. It is now recognised that teachers have a great role to play in developing learning communities able to take control of their own development. Emphasis must now be given to the role the teacher has within the community.

The Ministry of Education has set four competencies that teachers of all levels must exhibit. They will guide the nature, organization and management of all Pre-service programmes. They also provide a means of measuring progress towards the paradigm shift. The competencies are that teachers should be (MOE 2003):

a) Competent in producing responsible citizens;
b) Competent in subject(s) and the content of teaching;
c) Competent in the classroom;
d) Competent in areas relating to the school and the education system;
e) Competent in the values, attributes, ethics and abilities essential to professionalism in upholding the professional ethics.

**Others**

Information Communication Technology in High Schools has been launched as of the beginning year 2004. Curriculum revision through community participation has been running this year and will be completed for implementation by the next year.

## Concluding Remarks

The new Ethiopian Educational policy in terms of the goal seems to be relevant and in the right direction, in contrast to previous education programs. The policy is historical and a first in its kind, in the history of Ethiopian education. However, having the policy alone couldn't bring significant social, political and economical change to the society. This is due to the challenges faced the policy implementation for the last ten years time. The curriculum is designed along

with the general objective of the education. If the challenges are met and the curriculum is implemented practically and address the every day life of the learners significant positive changes can be accelerated in the country.

By applying the skills they have developed, students will readily connect their classroom learning to real-life activities in the world of business and public service. Work experiences in the community allow students to apply and enhance the skills and knowledge they acquire in their social science. The knowledge and skills students acquire in English and native language courses will assist them in their cooperative-education and work-experience placements. In academic placements, students will be required to read and listen, carefully and with attention to detail, to messages, instructions, and information, in order to perform placement-related tasks and duties efficiently, responsibly, and safely. Certain placements will have a specific focus on English literacy skills. For example, in placements with newspapers, television and radio stations, schools, and libraries, students will use their knowledge and skills to analyze texts, to conduct research, to write and revise texts, and to create media works.

The interpersonal, teamwork, and leadership skills that are emphasized in the health and physical education curriculum can enhance the success of students future work settings. Work experiences can introduce students to a number of career and job opportunities (e.g., athletic trainer, private recreation entrepreneur, recreation professional, activities director, health educator, sports writer, researcher, teacher, fitness trainer).

Programs should be designed to take into account local opportunities for students to combine work experience and classroom learning. Programs may also be modified to reflect community needs. In- and out-of-class components must be carefully matched and monitored so that students' learning experiences are relevant and authentic. Through participation in science-related learning activities in commercial, industrial, government, or academic laboratory settings, students can experience the application of knowledge and skills in specific areas of science in settings outside the school. These experiences give students the opportunity to practice and develop their own skills in problem solving, critical thinking, teamwork, and the safe and accurate use of scientific procedures and tools. In addition, they provide students with a clearer sense of the nature of careers in science-related fields. To effectively implement all these, necessary provisions must be provided and the program must be supervised frequently. Finally, the researcher would like to reflect that this small explorative work is not without limitations. Due to shortage of time, back and forth to the field to verify the collected data was not strong enough. However the study may help as a departure to conduct more extensive research in the area.

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# Cultural Features in Assessing the Outcomes of Mathematics Education

> *In order to understand why students in a particular system of education perform as they do, one must often reach deep into the cultural and educational history of that system of education* (Purves 1987, p. 104).

## Introduction

Education in any social environment is influenced in many ways by the traditions of these environments. It is reported in the research literature that especially mathematics education in a given country or system is very much influenced by the underlying education tradition and mathematics tradition. Culture refers essentially to values and beliefs, especially those values and beliefs which are related to education, mathematics or mathematics education. An example of a value that pertains to education is the importance attached to education in different cultures. An example concerning mathematics is the view of the nature of mathematics (e.g. whether or not it is essentially a pragmatic discipline). And an example of the belief that affects mathematics education is the attribution of success and failure in mathematics (e.g. attribution to effort or innate ability).

The idea what makes a "good" teacher or a good classroom depends on the culturally influenced expectations of students, parents and the teachers themselves has been expanded by the work of anthropologist and educational researchers. Rather than attempt to create more and more numerous sets of variables, these researchers emphasize the respondent's perceptions of

the social world, individual-level interactions, variations in cultural norms within nations and sources of conflict around key concepts, roles and institutions. The importance of "culture" in explaining the schooling process, or more basically, in identifying the boundaries of school as an institution, has played an increasing role also in the assessment studies of the IEA. (LeTendre 2002).

The accumulated research on cross-national achievement has led educators in many countries to take a closer look at factors that may be contributing to the students' performance, such as pedagogical practices, students' and parents' beliefs and attitudes about learning, and school culture. Indeed, examining how other cultures educate their children challenges us to look at our own system with a more critical eye.

Cross-national research on mathematics and science also has a potential to reveal the rich and varied ways in which students, teachers and parents conceptualize the meaning and value of learning. In this way, it can help us to understand the cognitive goals that each culture has for its students.

## Examples of Cultural Effects in Assessing Mathematics Performance

How can an understanding of differences in national cultural dynamics help us to understand international differences in student achievement? In the following I will describe some examples of cultural effects on mathematics performance. The analysis is limited the cultural traditions in East Asia and the West because similar interests in differences and correspondences have existed for a long time and experiences in equivalent research have been gathered. However, this does not imply that these are the most important human traditions.

The research examples I present in this paper characterize nations as being at one or the other end of a dichotomy. In this regard, Japan and United States have come to epitomize the comparisons that are made between "Eastern" and "Western" societies (Bembechat et al. 2002). Japan has been characterized as a culture that fosters interdependence, while U.S. culture fosters independence. Japanese people are said to be oriented around collectivist concerns, in which group loyalty and harmony lead individuals to subjugate their individual needs to those of the group, for the sake of the groups' well-being. In contrast, Americans are characterized as individualistic and concerned with fostering personal goals (Greenfield 1994).

The cross-national studies of achievement give us some insight into how logic of individuals' beliefs influences their behaviour. Stigler and Perry (1988) note that teachers in Asian cultures (Japan, Korea, Taiwan) routinely ask students to display their answers to mathematics problems with which they are experiencing difficulty. In contrast, mistakes and difficulty more often are experienced privately in Western (American) classrooms. Many American teachers and parents would view this Asian or Japanese practice as humiliating and cruel. Stigler and Perry (1988) attribute this different view of a particular pedagogical practice to a cultural difference in beliefs about the nature of mathematics intelligence.

On average, Japanese mothers and teachers are less likely than their American counterparts to believe that mathematics ability is innate (Bempechat et al. 2002). Therefore, with the appropriate amount of effort, all children can solve a problem. In this context, mistakes are not something to be ashamed of, but something to work through. The general European-American view of mathematics ability as innate contributes to the notion that mathematics errors

are the consequence of low ability, over which students have no control. To send students to the board, then, is to ask them to admit publicly that they have low ability. In the European-American context, this practice might foster concerns about the potential to erode students' self-esteem.

Many researchers have employed methods and constructs drawn from the American research context in order to understand why American students underachieve relative to their peers in other nations. There are many words, concepts and phrases, such as effort, ability and luck, which are commonly used in European-American context. However, we cannot assume that these conceptions on learning will be understood in the same or similar ways by students educated in other countries.

For instance, effort is a construct that is socially constructed around the notion of obligation to oneself, one's family and one's community. This is consistent with the notion of selfways by Markus et al. (1997), who showed that the process of selfing in the Japanese context is closely tied to one's social relationships. Holloway (1988) has demonstrated that effort does not mean simply "trying hard" as it does in the American context. Effort is a multilayered construct in which the performance of students is said to reflect on themselves, their parents, their families and the communities in which they are being raised. In short, effort is socially oriented, whereas in the American context it is perceived as individually driven.

Ability is also a construct that is similarly multifaceted. Research literature has shown that ability as an internal, stable and uncontrollable trait is not a sufficient definition. In contrast, much evidence has accumulated to show that many students perceive ability as a malleable quality that can grow as a function of effort (e.g. Nicholls et al. 1989).

Quite often, highly statistical analysis of educational achievement fail to record accurately how teachers, students, parents and administrators interpret the world around them. For example, one could theorize that a culture of competition in Japan drives high-stakes testing and the large cram-school system. Yet ethnographic studies of U.S. schooling also document a culture of competition, yet there has been little high-stakes testing or cram-school development in the United States (e.g. Grant & Sleeter 1996).

The expression of academic competition is affected by patterns of relationships between key concept, roles and institutions, and these patterns differ between The United States and Japan. In the U.S., competition pervades all aspects of student in school, particularly social life, and adolescents spend considerable energy in vying for social popularity or athletic supremacy. In U.S. school, there are distinct and separate social status hierarchies that split arenas of competition, "jocks" opposed to "nerds". In Japan, there is less differentiation of social status hierarchies and all social status hierarchies are affected by academic performance. (LeTendre 2002, pp. 206-207).

Comparative studies such as SIMS (Second International Mathematics Study) and TIMSS (Third International Mathematics and Science Study) have produced data indicating that there may be some systematic reasons for differences in achievement and practice between some regions. East Asian countries such as Japan, Korea, Taiwan, China, Singapore and Hong Kong consistently outperform western countries in North America, Europe and Australia in these international tests. These results have brought about a growing interest for policy makers and educators to find out the factors behind Asian students' high performance in mathematics.

For example, in his article Leung (2002) examined the four highest performing countries in the TIMSS study (Hong Kong, Japan, Korea and Singapore) and tried to find out background factors which can be used to explain the superior achievement of their students. Leung concluded that the country characteristics of the four countries do not give any clues for explaining superior performance. The fact that these countries share a similar culture (the Confucian Heritage Culture) seems to suggest that the high achievement is related to some cultural factors. Indeed, in the analysis of the New Zealand data, where the results of students of different ethnicity were analyzed, students of Asian origin seem to perform better than their counterparts (Garden 1996).

The most striking result of the questionnaire data is the lack of confidence in doing mathematics in students from the four countries (Leung 2002). This negative finding may be due to the stress in the cultures of these countries on the virtue of humility or modesty. Children from these countries are taught from their childhood that one should not be boastful. This may inhibit students from rating themselves too highly on the question of whether they think they do well in mathematics, and so the scores may represent less than what students really think about themselves. On the other hand, one's confidence and self-image are something that is reinforced by one's learned values, and if students are constantly taught to rate themselves low, they may internalize the idea to result in really low confidence. Furthermore, the competitive examination systems, coupled with the high expectations for student achievement in these countries, have left a large number of students classified as failures in their system, and these repeated experiences of a sense of failure may have further reinforced this lack of confidence.

According to Leung (2002) this negative attitude of the East Asian students did not seem to have affected students' achievement. In fact, one may even argue that the negative correlation between students' confidence in mathematics and their achievement is something to be expected. Overconfidence may lower students' incentive to learn further and cause them to put very little effort into their studying, and hence result in low achievement. This is exactly the kind of justification for the stress on humility or modesty in the East Asian culture. Teachers within this culture are not used to encouraging students even when are doing well, for fear that praise make students conceited and that hence, they do not put efforts into study.

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# A Value-Based View on Education for Sustainable Development

## Introduction

The extent to human pressures on ecosystems has increased enormously in the last 100 years. The level of the pressure has risen even more in the last few decades. Since 1980, the global economy has tripled in size, and population has grown 30 percent to over 6 billion people. Consumption of everything from food to computers to oil has risen substantially at a cost of ecosystems. Tree consumption for paper products has doubled over the last thirty years, resulting in about half of the planet's forests has disappeared. Additionally, concerning the oceans, global fishing has doubled. The pressures of the ecosystems are not likely to be decreased. Demographers predict the population to grow to nine billion during the next 50 years, and the global economy is expected to expand five times during this period. While crop diversity was reduced in the name of efficiency, environmental impacts and biodiversity consequences highlight the need for more diversity. By 2020 the demand for food (e.g., wheat, rice, and maize) is expected to grow 40 percent. Water demands for irrigation are also increased up to 50 percent or more. Two-thirds of the world's population live in areas that receive a quarter of the world's annual rainfall. Some thirty countries are already facing water scarcity. There is a disparity in the number of scientists and researchers varying from over 2700 scientific researchers per million people in the United States to 130 per million in India and fewer than 70 per million in Africa (Gonzales-Gaudiano 1997; Shah 2004).

UNESCO articulated the role of values and culture in moving toward a sustainable future: "… Sustainable development is widely understood to involve the natural sciences and economics, but it is even more fundamentally concerned with culture: with the values of people hold and they perceive their relations with others. It responds to an imperative need to imagine a new basis for relationships among peoples and with the habitat that sustains human life" (UNESCO 1997).

The International Labour Office (ILO) (2002) indicated that "People with low skills levels, outdated skills or no employable skills are more likely to be excluded from the labour market. Research indicates that the fastest growing occupations require the most education. Disadvantaged groups are excluded from opportunities that are central to the participation in the social, political and cultural life or society, resulting from their limited access to education, skills training, health care and employment. Their exclusion incurs high costs o social security systems and society in general. Also, the opportunity cost to national economies of having such a large supply of excess labour is substantial" (p. 4).

Achieving sustainable development does require a different approach to conventional economic thinking. Under the conventional model, the system that grows the most and the fastest is considered to be best regardless of its impact on the environment or on human society. The concept of sustainability addresses the imbalance by explicitly adopting the concept of 'development' over 'growth' (NCWD 2003). Education for sustainable development is most effectively promoted through learning. Therefore, teachers' training colleges, schools and teachers have an important role to advance the high quality sustainable development (Fien & Maclean 2000; Åhlberg 1998). Good learning and living environment consists of ecological, economic, social and cultural entity.

## Education for Common Good

Education aims at what is good and valuable, and is therefore inherently normative, as it seeks to convey something that is considered objectively valuable, such as education for sustainable development. Normative values education entails belief in the existence of objective values. For example, the notions of justice, truth, and good are there, irrespective of one's personal valuations. Granting that objective values do exist, statements concerning these values can be either true or false. Prevailing values in society as well as those of individual persons may be inconsistent with objective values. In the field of education we need to justify why it is necessary to teach the particular, given values, such as sustainability, peace, democracy and multiculturalism. Education for sustainable development can aim at promoting global values. Every body has a right to have the healthy environment, clean water and basic education. A base of sustainable development comes from the UN (United Nations) Declaration of Human Rights.

Since the 1980s, the planetary interdependence stemming from globalization has increased debate and media coverage of human rights in many arenas. The recommendations that came out of conferences held during the present decades, e.g. Rio de Janeiro, Cairo, Copenhagen, Beijing and Johannesburg, have been based on an affirmation of human rights such as rights to a clean environment, socio-economic rights, the rights of women and education, and the right to housing. More and more attention has been paid to educating the workforce with regard to sustainable development in many countries.

## Education for Sustainable Development

Education for all (EFA process) remains the foundation for the achievement of sustainable human development. Basic education will continue to be an absolute priority, as it forms the

essential first step towards further learning and plays a critical role in the shaping of values and the development of other necessary life skills.

Education means mastering one's own destiny; it means personal sovereignty. It is the key to a genuine participatory democracy, which is closely related to development and peace. It is not just about knowledge; it is also about learning to do, learning to be and above all learning to live together.

Each country's capacity to move towards sustainable human development depends on the existence of skilled human resources in the scientific, technical and professional fields needed for addressing complex environment, resources and development issues (Raumolin 2001). Training of the right kind and number of scientists, experts, technicians and educational personnel is needed in the most of the countries. Most current training programmes are sectoral or disciplinary and do not address the complex interactions between people, resources, environment and development.

*Environmental education* is associated with the aims of sustainable development. Originally the focus was on nature conservation in our immediate surroundings, but it has since expanded to cover the whole globe including natural, cultural, social and virtual environments. Environmental education underlines willingness and ability to contribute to the realisation of a socially responsible and sustainable lifestyle. As examples of the issues dealt with in environmental education we can name

- human's relationship with nature in the course of humankind;
- human vs. nature relationships as conveyed by religions (Allahwerdi 2001);
- familiarisation with environmental problems and protection, natural and food resources and their meanings for different nations;
- relationship between natural resources and wars.

*Sustainable development* was introduced in the World Conservation Strategy (IUCN, 1980). Conservation refers to management use of human use of the biosphere to yield the greatest sustainable benefit to the present and future generations. Development refers to modification of the biosphere and the application of human, financial, living and non-living resources to satisfy human needs. The aim of development is to improve the quality of human life. The conservation and sustainable development are mutually dependent.

*Peace* is a condition for sustainable development. In connection with *peace education*, the concept of *culture of peace* highlights the notion of values, norms and social practices. As for the means to achieve a culture of peace, we have human rights education in association with the ideas of tolerance, democracy, and sustainable development. The construction of a culture of peace essentially involves human growth into a citizen who is conscious of needs for protecting physical, social and intellectual environments. A major focus of peace education is to enable and empower people to handle conflicts more creatively and less violently. A lot of knowledge and skills, theory and practice are required for promoting a culture of peace as a condition for sustainable development. According to Johan Galtung (2003), peace studies are an applied social science, just as medicine is applied anatomy, physiology and pathology. It is meaningful if it leads to action. To understand peace and violence we need to consider basic human needs for survival, well-being, freedom and identity. Development aims at promoting those needs; violence insults them but peace preserves them.

There are three types of violence and hence three types of peace: direct, structural and cultural. Direct violence insults human needs with the deliberate intention to hurt and harm; structural violence does so more indirectly. Cultural violence is symbolic and refers to those aspects of our cultures that are used to legitimize direct or structural violence. These types of violence may be the worst obstruction for sustainable development.

*Education for sustainable development* means that we try *to see the globe as a whole and understand our joint responsibility for its wellbeing*, including the human life and physical environment. Education for sustainable development aims to raise citizens to adopt the knowledge, skills, attitudes, values and living styles that ensure a good life for the next generations globally. Other highlighted objectives include growing into a cosmopolitan, or a citizen of the world, as well as facing the environmental problems of the world and solving them. Allahwerdi (2001) discussed the concept of development education that opens up a global perspective to local and national issues. For example, development education includes

- personal and practical involvement in the promotion of sustainable development trends in view of the future;
- familiarisation with developing countries, their relationships with industrialised countries, and reasons of inequality, as well as with the structures of world economy;
- discussion about the concept of development and critical examination of industrialised countries in order to understand that just and sustainable development calls for changes in our lifestyle, e.g. renouncing waste and the pursuit of increasing economic growth;
- equity between genders, age groups, social classes, religious groups, nations and ethnic groups and growth into absolute respect for human dignity.

Curricula and pedagogy of education for sustainable development have leant on multidisciplinary and holistic approaches, problem-solving and project-based teaching and learning, promoting ethics (environmental values and attitudes) and critical attitudes (e.g., attention to conflicts of interpretation in science, attention to conflicts of interests in society, and equitable attention to North-South issues on the global scene).

## Transform from Environmental Education (EE) to Education for Sustainable Development (ESD)

The World Commission on Environment and Development (WCED) published *Our Common Future* in 1987. The report introduced the concepts of 'sustainable development' and 'sustainability'. In the report, sustainable development referred to "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 1). In many countries, a lot of efforts have been undertaken to put this concept into practice. During the Rio Earth Summit in 1992, Agenda 21, the global action plan was developed. Agenda 21 has provided an important starting point for the regional, national and local governments to guide and initiate sustainability projects all over the world. Chapter 36 of the 1992 Earth Summit Report addressed the importance of education as follows: "Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues … It is critical for achieving environmental and

ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making" (Agenda 21, p. 2).

Debates of the issues related to North-South dimension, changes in production and consumption models and local solutions have shifted an emphasis on sustainable development since the 1980s. Environment education after the 1992 Rio Summit has been conceptualised as education for sustainability emphasising fair and equitable global distribution. Raimolin (2001, p. 25) has compared environmental education (EE) and education for sustainable development (ESD) and the differences in focus:

| *Environmental Education* | *Education for Sustainable Development* |
|---|---|
| Local/international problems | Global problems |
| Conservation and pollution | Sustainable development |
| Curriculum and teaching methods | Ecological school |
| Environmental values and attitudes | New cosmo-visions |
| Eco-citizen | New civilisation |

The 2002 Johannesburg World Summit on Sustainable Development emphasized that there is still a lot to do for sustainability. The focus was set on policies to integrated sustainable development into all disciplines at every level of society. *Education was placed as one of the top priorities for the advancement of sustainable development*. Education and training in each education system was seen necessary to be reoriented to increase awareness, understanding and support for sustainable development (Johannesburg Summit 2002). Among others, the Government of Finland is committed to integrate sustainable development into its decision-making process to ensure so that social, economic and environmental implications are considered in the development of different national programmes, products and services Ympäristöministeriö, 1998). The Finnish education policy goals include sustainable development as a curriculum objective. The Finnish Ministry of Education has emphasized the promotion of sustainable development in its policy guidelines "Education and Research 2003-2008: Development Plan".

UNESCO, being an active initiator from the very beginning, has drafted a comprehensive implementation scheme for education for sustainable development based on Agenda 21 (UNESCO, 2005). UNESCO has also launched the *United Nations Decade of Education for Sustainable Development 2005-2014* based on the resolution of the 57th meeting on the United Nations General Assembly in December 2002. "Education for sustainable development is fundamentally about values, with respect at the centre: respect for others, including those of present and future generations, for difference and diversity, for the environment, for the resources of the planet we inhabit… The goal of the Decade of Education for Sustainable Development is to integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all" (UNESCO 2005, p. 5). Sustainable development consists of society, environment and economy with culture as an underlying dimension.

## Evaluation of Education for Sustainable Development

Yet education for sustainable development has many challenges. One of them is to bring it from systemic thinking into practical contexts. From this perspective, Fullan (2005) defines: "Sustainability is the capacity of a system to engage in the complexities of continuous improvement consistent with deep values of human purpose" (p. iv). The eight elements of sustainability, that bring the principle to the practice, are as follows: (1) public service with a moral purpose, (2) commitment to changing context at all levels, (3) lateral capacity building through networks, (4) intelligent accountability and vertical relationships, (5) deep learning, (6) dual commitment to short-term and long-term results, (7) cycling energizing, and (8) the long lever of leadership (Fullan 2005).

Education for sustainable development has been incorporated into school and college activities. For example in Finland, the National Board of Education has provided the guidelines of environmental quality criteria and of sustainable development auditing instructions for the educational institutions (Hyytiäinen, Hämeenoja, Hänninen, Leinonen & Tenhunen 1999; Opetushallitus 2003). Education for sustainable development changes the objectives of teaching and learning. According to Raumolin (2001, p. 2), "In addition to curricula and pedagogics, special stress should be laid on school metabolism, transport issues, socio-economic health, and integration into the community as well as the Agenda 21 and provincial, national, regional and global networking."

Rajakorpi and Rajakorpi (2001) evaluated the Finnish educational institutions to what extent education for sustainable development was implemented in curricula, teaching and everyday activities among elementary, secondary and adult education schools (n = 429). The parameters that measured the principles of sustainable development were developed in the study. The results of the evaluation revealed that sustainable development was implemented both in curricula, teaching and everyday activities fairly well assessed by personnel groups. Vocational schools were found to be far ahead both in teaching curricula and in their practical actions compared with the other schools.

Raimolin (2001) has studied the strategies of education for sustainable development. He revealed three types schools and their strategies. Categorisation presented in Table 1 is more theoretical than practical as in reality the features of different strategies may function the same time.

Ecologisation of schools is to contribute to safeguarding the quality of living on a lasting sustainable basis. Citizens are to be empowered in a narrower sense to make an active and constructive contribution to sustainable social development (Rauch 2002).

Reid (2002) requests "rather than what education might do for sustainable development, what might sustainable development do for education?" Rauch (2002) has concluded a key challenge: "… a capacity to tolerate complexity and contradictions while remaining capable to act, to accept existing achievements and accomplishments (reflective attitude) while being critical, and to engage in cooperation while acting self-reliantly".

***Table I.*** *Typology of sustainable school (see Raimolin 2001, p. 26-27)*

| STRATEGY/ SCHOOL TYPE | BUSINESS-AS-USUAL STRATEGY | INTERMEDIATE STRATEGY | INTEGRAL STRATEGY |
|---|---|---|---|
| NORMAL SCHOOL | Cheaply built and maintained buildings<br>Lip-service to SD<br>Separate EE<br>Little attention to North-South issues<br>Compliance with basic communal, national and international standards | | |
| GREEN SCHOOL | | Selective incorporation of environmental and ecological issues concerning school metabolism, curriculum and teaching, local integration and networking<br>Application of environmental management certificate<br>Weak points: architecture and buildings, transports issues, the North-South dimension | |
| ECOLOGICAL SCHOOL | | | Integral incorporation of environmental and ecological issues beginning with architecture and buildings, extending to curriculum and teaching and involving the North-South dimension |

The research team of the National Centre for Workforce Development in its empirical study identified the broadly transferable sustainable development related knowledge, skills and attitudes required by the workforce (NCWD 2003). The six major themes are:

- Ethics and values
- Integrated decision making
- Responsible use of resources
- Valuing diversity
- Safety and well-being
- Continuous improvement

In the increasingly globalised world, awareness of values as well as active public debate and citizens' participation are gaining emphasis. Sustainability refers to a way of thinking, to a value-based approach, and to value orientation in decision-making and its criteria.

## Values, Knowledge and Skills for Sustainable Education

Key objectives of critical education consist of cultural pluralism and integration, approved and supported cultural diversity, justice and equality. From the perspective of learning, also aspiration toward cultural continuity, maintaining and fostering the specific cultural heritage and experience of various ethnic and cultural groups, accounting for different learning styles, and support to ethnic identities are inherent elements in multicultural education. The aim is to provide all groups with education of good quality.

Values are closely related to attitudes, conceptions, and beliefs. As such they also have influence on people's actions and activities. Values education as outlined by UNESCO is associated with humanism, culture and international. UNESCO aims at incorporating humanistically and multiculturally oriented values into school education. The traditional teaching methods may not be the most effective ways to teach and learn the global values.

The notion of the purpose of life is associated with reaching a goal, either accomplishing something or achieving a certain state of affairs, or living a valuable life of a certain kind. The purpose of life can hence be addressed through performance values and person values. Performance values are pertinent to causing changes in external things. Person values, in contrast, are connected to changes taking place in a person's mind (e.g. intellectual and moral values involved in critical reflection). A Finnish philosopher, Ahlman (1921), categorise values as follows (see also Puolimatka 1995):

- hedonistic values (happiness, pleasure, joy, enjoyment, sensuousness)
- vitality values (life, health, will, fitness)
- aesthetic values (beauty, sublimity, loveliness, art)
- cognitive values (truth, knowledge, learning, education, wisdom, science)
- religious values (faith, hope, holiness, charity)
- social values (altruism, friendship, love, loyalty, liberty, brotherhood, honour, patriotism, security)
- power values (force, power, war, wealth, border, victory)
- justice values (justice, human rights, equality, legality)
- ethical values (goodness, moral justification)

Many of these basic values are significantly related to sustainable education and environmental protection. Vitality, aesthetic, cognitive and ethical values may be seen directly linked with sustainable development. The rest of the values listed above indirectly contribute to promoting environment protection (Oksanen, M. & Rauhala-Hayes 1999). In short, by 'value' we refer to an abstraction, a kind of standard, which influences our choice of intentions and goals as, among others, Sirkka Hirsjärvi has defined it. Values direct individuals' and groups' choices and are manifested in words and deeds. Values can also be divided into absolute values and instrumental values. Absolute or end values (e.g. moral good, truth, beauty, justice, sustainability and

holiness) represent ultimate goals, while instrumental values serve as means to these ends. The methods of education serve as means to sustainable development.

Attitudes include elements of appreciation and come thus close to values, but are narrower in their scope and focus. Attitudes affect the selection of instruments by means of which we try to reach the values and, hence, attitudes can often be derived from one's values. Most often attitudes have been studied through verbal reactions. Rigid, prejudiced attitudes towards a gender or environment protection, for example, are called stereotypes.

Education and training usually has aims and objectives, which reflect the good and desirable things sought for. The purpose of education is to provide the learners with such capabilities by means of which they can attain a good life for themselves and for others. Education is essentially an ethical activity, where certain values are inherently present. Classical philosophers, such as Plato and Aristotle, already set 'good life' as the yardstick for human life. What is good life is a key question in the life of human beings. In the same fashion, in the field of education we can ask what is good education and development. Certain values can be regarded as aims of good life. Values that promote the common good are desirable. The task of environmental education is to guide citizens into continuous environmental protection, which is part of qualification for workforce. Drawing on value-based competence and related skills to make well-founded value decisions, we can determine contents and aims for sustainable education.

## Challenges for Teaching and Learning

The pursuit of good life and good deeds are also realised in practice. John Dewey (1916) was characterised by his developmental optimism, his belief in the ethical development of communities and collaborative problem solving. According to this developmental optimism, cultures evolve all the time, increasing their moral level along with rational problem solving. Dewey's ethical and epistemological thinking accentuated consideration of the situation and context of operation. Judgements about their justification should be drawn with relation to the particular context of operation.

The critical view of education for sustainable development leans on the theories of critical sociology and critical pedagogy (Freire 1969; Giroux and MacLaren 1994). Critical education for sustainable development is a way to perceive the world and to understand dissimilarity and 'alienage' as products of history, culture, power and ideology. The equality of human beings is discussed by looking at the existence of ethnic identities and cultural differences and their prospects in the changing world. As regards educational practice, critical analysis targets at the ways school tends to keep up and produce, through its disguised curriculum, for example, such categories and labels as sex, social class, race, language and disability. The critical view also seeks to find remedies for inequity.

Culture can be defined as an integration of the learnt behaviours and related products characteristic of a particular community of people. Culture is transmitted and survives through communication and learning. It can also be regarded as a holistic constructive-symbolic system that is fundamental to human identity, thinking, and learning. Reality is composed of shared symbols and tacit agreements, values, interpretations and mental images about the world we live in. The cultural formula is both a representation of reality and a model for meeting this reality.

Education for sustainable development is culture-bound. Schools and homes as well as teachers and students as individuals represent different views of values, norms and lifestyles that have impact on environment.

## Conclusions

The Earth Summit adopted Agenda 21, a comprehensive blueprint for actions leading to sustainable development, including detailed work plans, goals, responsibilities, and estimated for funding. Today the notion of sustainable development includes ecological, economic and social sustainability. According to UNESCO (2005), education for sustainable development comprise

- socio-cultural perspective (peace and human security, gender equality, cultural diversity and intercultural understanding, health, HIV/AIDS and governance);
- environmental perspective (natural resources such as water, energy, agriculture and biodiversity, climate change, rural development, sustainable urbanisation, and disaster prevention and mitigation); and
- economic perspectives (poverty reduction, corporate responsibility and accountability, and market economy).

Education for sustainable development covers formal and non-formal education, local civil society, media and workplaces. Especially the role of higher education is essential in educating professionals and producing new knowledge through research on sustainable development. The United Nations Decade of Education for Sustainable Development lays the foundation to reform and mobilize education at all levels, from elementary schools to universities, in support of sustainable development.

As many researchers have indicated, among others Mortensen (2000), education for sustainability is a new paradigm, based on a life long learning process, leading to an informed and involved citizenry having the creative problem solving skills, scientific, technological, and social literacy.

*"Our biggest challenge in this new century is to take an idea that sounds abstract –sustainable development – and turn it into reality for all the world's people"*
*(Kofi Annan, 2001)*

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# Education for Sustainability in Academic Teaching and Learning

## Introduction

The concept of sustainability is commonly used in major national and international declarations and institutional policies to serve many purposes including sustainability reports of multinational corporations and official documents at local, national and global levels. It has acquired many meanings after it emerged from English-speaking academic circles during the 1970s. However, despite this publicity, most people cannot come up with meaningful descriptions of sustainability and concepts like active citizenship and cultural diversity connected to it (Boehmer-Christiansen 2002; Jucker 2002; Wright 2002). This seems to be often the case among educators as well (Slater 2001). In the front line addressing these challenges are teachers working at universities and especially those in charge of teacher education. How to implement issues connected to sustainable development in academic teaching and learning in as many fields as possible? In this paper some key concepts connected to sustainable development, different approaches to learning, and teaching methods and arrangements fostering education for sustainability in higher education are looked into.

## Education for sustainability

Uncertainty and confusion among teacher educators about expectations implementing themes connected to sustainable development in teacher education and school practices was one of the main reasons why EU Comenius project TETSDAIS - Training European Teachers for Sus-

tainable Development and Intercultural Sensitivity was initiated 2001. The partners of this three years project came from universities in Portugal, Spain (Balearic Islands), United Kingdom and Finland. They shared common research interests in geographical and environmental education as well as in education for sustainability. The target groups of the project were European teachers and teacher educators (TETSDAIS 2004).

The main discussion point was how to encourage the professional development of European teachers on the themes of sustainability and intercultural sensitivity and how to integrate these themes in school curricula to meet student needs. In order to achieve these goals, at the beginning of the project the ideas were shared and discussed in depth between the partners and were summed up in three phrases of action: The theoretical concepts connected to education for sustainability were clarified, a questionnaire dealing with environmental attitudes and values of 15-year-old students was conducted in partner countries. Finally the conclusions of these efforts were put into action during two in-service courses for European teachers arranged by the TETSDAIS partners and disseminated via research papers, materials and news on the project's web site (e.g. Kaivola & Cabral 2003).

In this paper education for sustainability is defined after Åhlberg (e.g. 1998a and 1998b) as pedagogical approach in which different aspects of sustainable development – economic, social, cultural and ecological – are integrated in academic thinking and action (Figure 1). Education for sustainability fosters a student-centred approach with a focus on improving academic, higher-order thinking skills as well as teaching and learning in meaningful ways. It is research-based and concentrates on issues promoting good life and environment for the present and future generations. One of the core objectives is to empower students for pro-environmental action based on critical scientific realism. The arrangements of education for sustainability are organized taking into account the principles of sustainable living, e.g. setting timetables so that students can travel back and fort between university buildings as little as possible and use public transport. Also materials used and produced during the courses are exploiting natural resources as optimally as possible.

## Two metacognitive tools and collaborative knowledge building to promote education for sustainable development

We have tested at university level for 15 years two metacognitive tools which clearly promote meaningful and deep learning, thinking and acting: improved methods of concept mapping and Vee heuristics (Åhlberg 1998a; 1998b; Åhlberg 2004; Åhlberg, Äänismaa & Dillon 2005). By concept mapping it is easy to show both the whole and its relevant parts and identity the most important connections between them. All kinds of tentative theories of sustainable development can be explicated and tested better by concept mapping. It is also a tool to promote shared understanding. Vee heuristic is a tool in which students are forced to think e.g. values at the beginning of their learning projects and again at the end of the learning projects. Åhlberg has successfully used concept mapping and Vee heuristics at university level for 15 years. Student teachers use them in their reflective reports that they write after their field practice. Part of this work is described in Åhlberg and Robinson (2004). Also collaborative knowledge building has promising possibilities in future to promote education for sustainable development. We have experimented with it since the year 1999 (Åhlberg et al. 2001).

University students ought to learn how to explicate their own tentative theories and how to test them both theoretically and empirically. Improved methods of concept mapping and Vee heuristics are very practical tools to promote this kind of intellectual development, and related teaching-studying-learning processes (Åhlberg 1998a; 1998b; Åhlberg, Äänismaa & Dillon 2005).

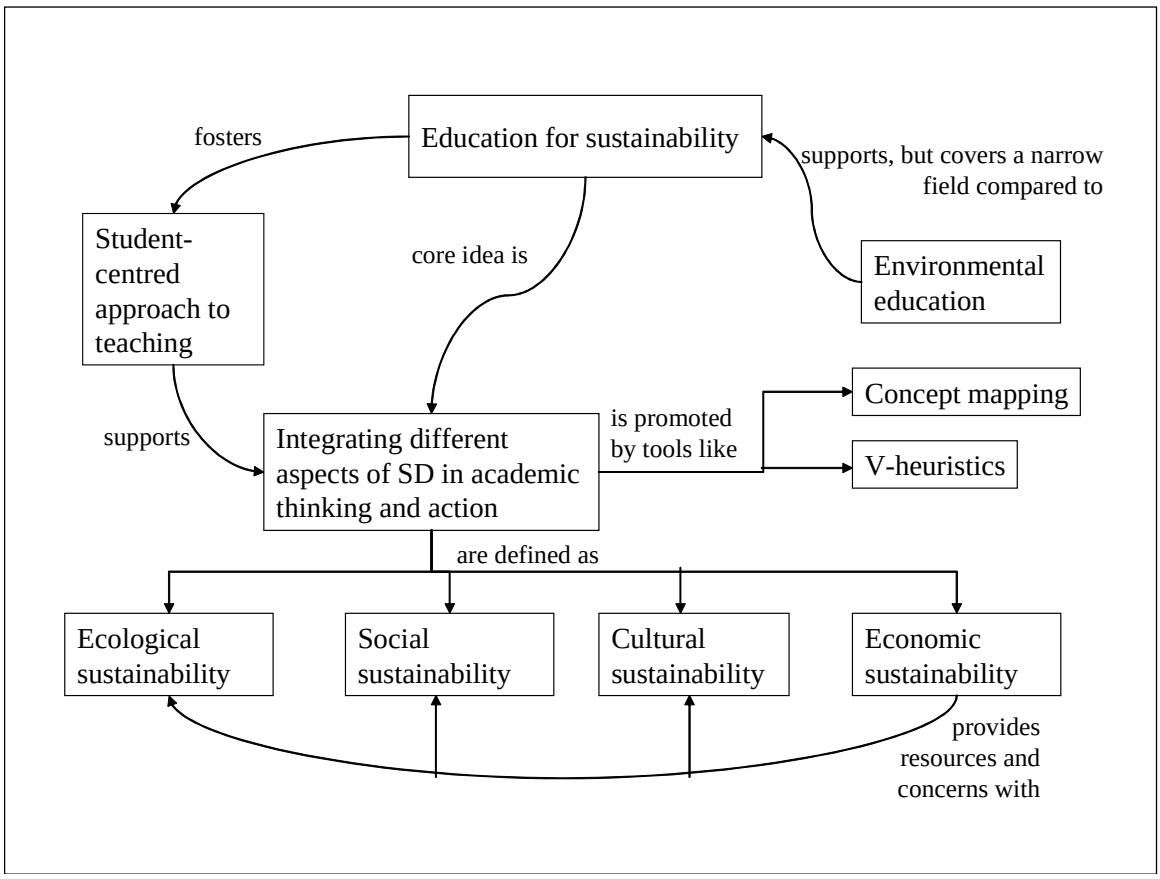


***Figure 1.*** *Education for sustainability*

## Education for Sustainability and Student-Centred Teaching

### The Role of Teaching Methods

What kind of teaching methods support education for sustainability with a student-centred approach? Student-centred teaching is often understood in terms of specific, innovative methods of teaching, such as small-group teaching, problem-based learning, and various applications of information technology. As many of us have noticed in practice, talented students achieve well in any circumstances. However, also they are benefiting from learning activities, which foster student-to-student interaction. As illustrated in figure 2, students with high-level engagement in their studies come up well regardless of the teaching methods used. The "non-academic" students with a low-level of engagement for example due to earning their living by working half a day and studying only on a part time basis seem to benefit most from mostly peer-controlled teaching methods like problem-based and co-operative learning (Biggs 1999).

But if the term is more broadly conceived, it represents a way of thinking about teaching and learning which ensures that the learning of students is given equal prominence to the demands of the academic discipline. It is with this broader view of student-centred teaching that potential conflict with academic freedom occurs. This broader conception does, however, free the term from specific teaching methods. Any method can, in principle, be used in either a teacher-centred way that focuses on the transmission of disciplinary content, or in a student-centred way that is more directly concerned with the conceptual and skill development of the student. Although certain methods do lend themselves more readily to one or other approach, all conventional teaching methods can be adapted to student-centred approaches (Buttler 2003).

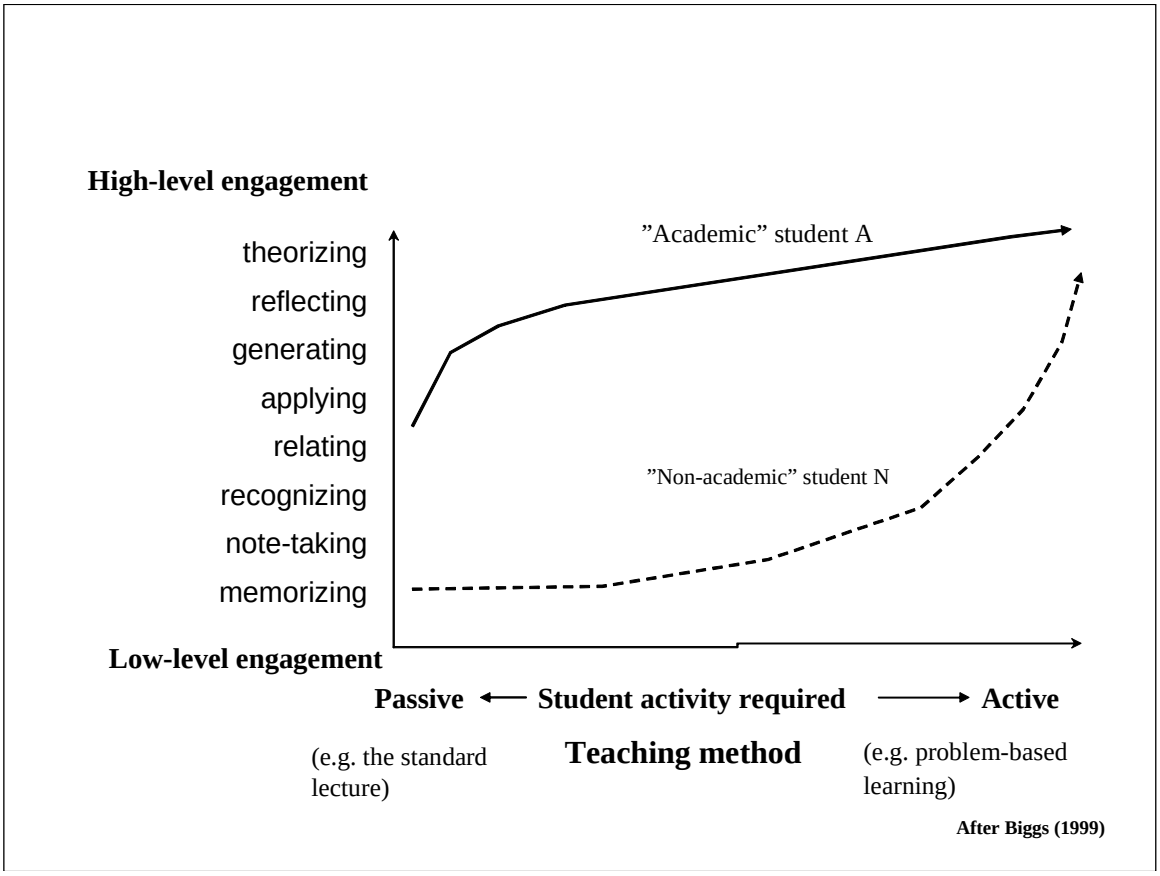


***Figure 2.*** *Student orientation, teaching method and level of engagement (Biggs 1999)*

## On Lecturing in Large Classes for Sustainable Learning

Currently, facing large teaching groups is common day reality for most academics. However, supporting deep approach to studying is also possible to be taken into account in large group teaching situations. It seems quite evident, that following a rhythm in which teacher talk and student talk take turn to activate the students to reflect on the issues dealt with during the lecture. This simple procedure is reasonably easy to implement. It gives both the teacher and students time to think over the explanations why we are doing what we are and how the issues dealt with are connected to the objectives and content of the whole course.

The two iterative main phrases during a lecture are: Teacher talk for about 15 – 20 minutes and student-to-student reflection or individual working for about 5 – 10 minutes. The student talking or thinking time is not meant for taking a break; on the contrary, the aim is to activate the students individually or in pairs to think over the key points of the issues under discussion by simple learning tasks. Activating the lecture breaks can be done in many ways, for example by motivating the students to revise and improve their notes, by asking each student to write down a question or comment or by putting a question or a problem to a transparency. The students can either talk to each other or work individually in silence. At the end of the student time, the lecturer can answer some questions if necessary.

Attention should be also paid to save time for a wrap-up at the end of the session. Wrap-up is needed for many reasons, of which integrating the session in a bigger picture is the most important one. At the end of the session, the students can be asked to answer for example the following questions on a separate paper: (1) What do I most want to find out in the next class? This makes students to think about the purpose of the whole course and prepare themselves to do e.g. pre-reading for tests. (2) What is the main point I learned today? This question gives feedback to the teacher of his/hers teaching. (3) What was the main point left unanswered in today's session? This way the teacher gets a clue of misconceptions and ideas of main points of the students and can take them into account while preparing the next lecture (Biggs 1999).

**Approaches to Learning**

The crucial indicator of a student-centred approach is the breadth of consideration undertaken by the teacher in designing the curriculum, the range of teaching and assessment methods adopted to achieve aims in the most appropriate manner, and the learning climate developed within the department. There is accumulating research evidence that staff who hold a broad, integrative conception of teaching and learning are more likely to adopt teaching methods which encourage students to seek meaning for themselves. This so-called deep approach by students generally leads to higher levels of academic understanding, and so a greater likelihood of being able to transfer their knowledge and skills to other contexts within research fields and employment (Biggs 2001; Entwistle, McCune & Walker 2001; Buttler 2003). Furthermore, the three approaches to studying – deep, surface and strategic – are defined shortly leaning mostly on Biggs (2001) and connections between these approaches are illustrated as a concept map in the figure 3.

The deep approach is based on intrinsic interest to engage the studying task appropriately and meaningfully. The focus is on underlying meanings, main ideas, themes and principles rather than on conceptually unsupported specifics. The particular strategies that are optimal for creating meanings depend on the task in question and earlier knowledge of the issues dealt with. However, the readiness of students to activate this approach depends on the quality of teaching and especially on the assessment methods used.

The surface approach or orientation to learning is based on intention that is extrinsic to the real purpose of studying in general or during a particular course. The task is seen as a hurdle to be cleared as soon as possible and with as little time and effort invested as possible. Rote learning content without understanding is one of the most common ways of doing this. This inefficient studying is connected to low achievement and leads often to dropouts and delays.

The last but definitely not the least orientation to studying is called strategic of achieving

approach. It is motivated by a desire to obtain high grades and can be connected to both of the other approaches to studying. The main strategies are to organize time, working space and syllabus coverage cost effectively, using and developing study skills, planning ahead and allocation time according to task importance. However, it is quite inappropriate to categorize students as surface or deep learners, because their approach depends on context. This brings us back to one of the main points of education for sustainability, which is focusing on the learning activities and general approaches we want students to engage. In future it is probable that our theories of what is high quality learning, thinking and acting for sustainable development have to be broadened and deepened (e.g. Åhlberg 1998a and 1998b) to include aspects of meaningful, deep, creative, meta-cognitive etc. learning. However, because of space limits it cannot be done in this article.

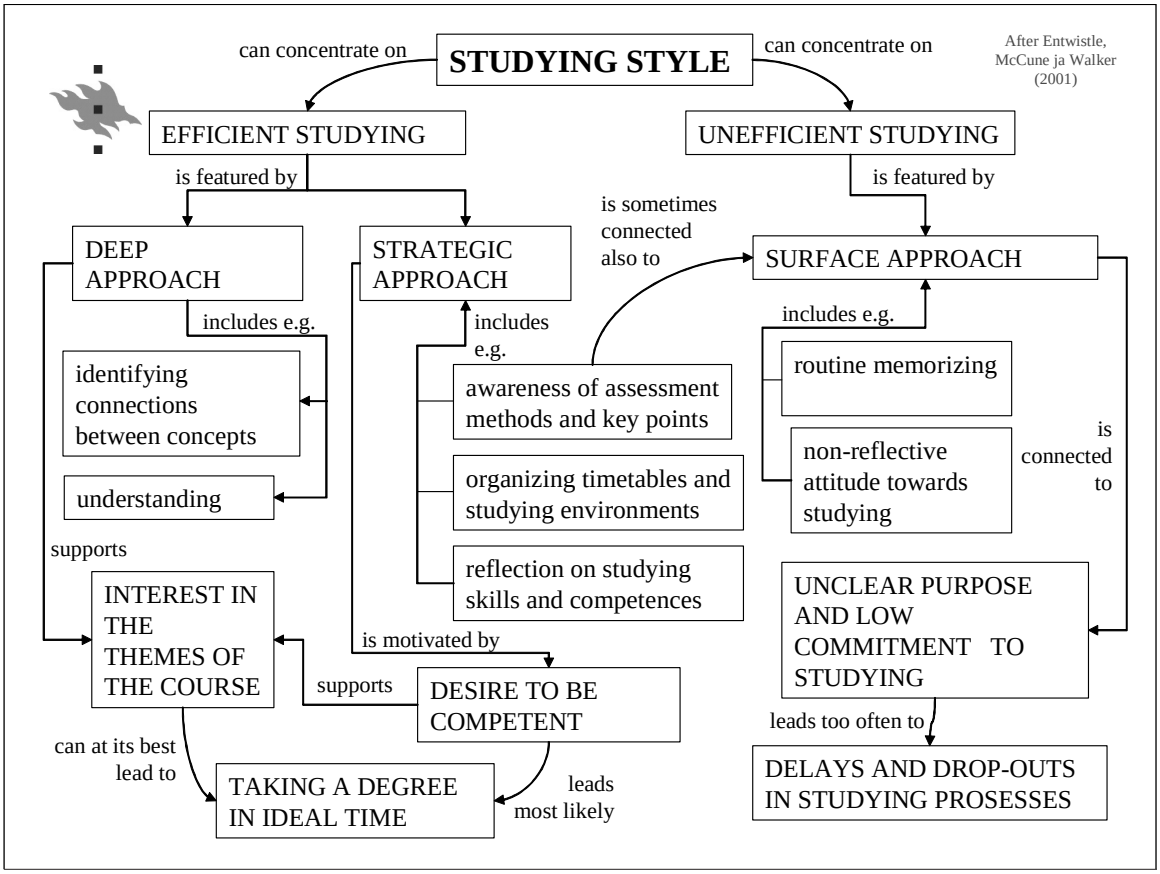


***Figure 3.*** *It seems quite evident, that students with deep approach are most likely to achieve at their best in their studies if they are also capable of using strategic approach (Entwistle et al. 2001; Lindblom-Ylänne et al. 2003).*

## Aligning Teaching with Education for Sustainable Development

In this case, the concept of student-centred approach can be seen as an essential part of education for sustainability and called sustainable learning, as Ramsey et al. (2002) suggest. Sustainable learning can be initially defined as learning in which the values of sustainability are taken into account and the students are engaged with high quality learning processes and are encouraged to seek cognitive consistency by aiming to maximize all the values involved.

In order to meet these aspirations and principles, sustainable learning and education for sustainability should be aligned to foster meaningful learning for good life and good environment. Alignment means that the curriculum is stated in the form of clear objectives, which include the level of understanding rather than simply a list of topics to be covered (Biggs 2001; Åhlberg 1998a and 1998b). All the teachers and students involved in the course have to be made aware of the objectives and requirements. The objectives should be based on ethical values with a cognitive and affective domain. The content of the course should rest, as often as possible, on the ideas of critical scientific realism, which means that the emerging applications of existing theories can be tested and improved continuously, as was explained earlier in this article. Teaching methods should concentrate on addressing problems of the real life and the targeting to help students solve these problems in order to achieve better understanding of the world. And finally, serious attention should be paid to the evaluation and assessment tools used, because students tend to choose studying strategies with which they think they are meeting the demands of assessment as light as possible. If the assessment tools emphasize memorizing and rote learning without deeper understanding, the students with strategic approach will choose surface orientation. Evaluation should be designed to test student achievement aligned with the goals and teaching arrangements used with deep approach to studying and learning in mind.

As Biggs (2001) points out, when objectives, teaching and assessment are aligned, all components in the system address the same agenda and support each other. The objective of education for sustainability in higher education is to integrate themes of sustainable development into all academic disciplines. Fostering sustainable development and learning to solve complex environmental problems requires multidisciplinary co-operation. This is not an easy task. However, more and more support as well as pressure is coming from local, national and international agreements to implement sustainability in curricula on a wide range in higher education. The initial steps have already been taken and many promising signs are on the air. Now it is time to put more effort on designing research based, high quality teaching–learning programs for university students.

Sustainable development and education for sustainability involve many complex problems, starting from their definitions. The only way forward is to explicate our tentative theories, to test them both theoretically and empirically, and to build better theories and practice. We have suggested two metacognitive tools for promoting high quality learning, thinking and acting for sustainability: improved methods of concept mapping and Vee heuristics. These tools are used to support student achievement, but also to help university teachers with developing their teaching and pedagogical skills for a better and sustainable future.

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WORKING PAPERS
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AS A MEMBER STATE OF UNESCO, Finland has adopted the policy goals and strategies of sustainable development that includes ecological, economic, social and cultural aspects. The Finnish Ministry of Education emphasizes the promotion of sustainable development in its policy guidelines "Education and Research 2003–2008: Development Plan". This publication focuses on a cultural aspect of sustainable development, especially on education. The articles of the volume have been written as a part of the project titled "Measuring Indicators of Sustainable Development in School Curricula: A Study of Ethiopia, Ghana and Nigeria" that is funded by Academy of Finland. The African and Finnish scholars discuss the educational and cultural aspects of sustainable development in the publication.

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