Technology Justice, Millennium Development Goals, Global Learning

Teacher's Guide for the 'Make the Link' project

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This is an informative introductory document for the teachers (Physics, Design & Technology, Health Education), who will use during his/her teaching some of the material developed in the context of the Make the Link project.

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Overview: 'Make the Link' project

The Research and Development Centre CARDET (www.cardet.org) has recently launched its three-year EuropeAid project "Technology challenging poverty: Make the Link". CARDET participates in the project as a partner, along with the Practical Action (Lead Partner- UK), the Engineers without Boarders (UK), the Centre for Science Education (UK), the Oxfam Italia and the CCE (Poland).

'Make the Link' envisions integrating issues around Technology Justice into the Science and Technology curricula of the early secondary classes of the EU member states' educational systems. Technology Justice - the right of all people to the technologies they need to live a life they value, without harming others now or in the future - will be explored in relation to the Millennium Development Goals, with a particular focus on sub-Saharan Africa. Technology Justice and Global Education methodologies (such a learner centred, participatory and dialogue led teaching), will be incorporated into exciting teaching materials, in a programme that includes schools outreach, teacher training and policy influence. A set of on-line and printed resources, will be developed, reaching over 13,000 teachers, while, training will be provided to more than 1600 teachers. Partners expect to gain the support from over 200 key influencers and decision makers for the project, resulting in the integration of global issues into the policy and/or high level practice at national and European context.

In this document you will find descriptions and analysis of the concepts (a) Technology Justice, (b) Millennium Development Goals and (c) the pedagogical practices of Global Learning.

Technology Justice

Humanity now faces a huge challenge. The way we define technological innovation from now on will determine if we can ensure a sustainable future for the welfare of all people. This means that our development and use of technology must comply with the principle of **'technological justice'** – the right of people to decide, choose and use technologies that will help them live the lifestyle they want, but without compromising the perspective of other people and future generations to do the same.

The concept of technological justice requires a review of the way used to promote the technological innovation, both in the developing and the developed world, in order to gain social value and be environmentally sustainable. The charitable organization Practical Action (http://practicalaction.org/) seeks to develop technological justice and sensitize the world not only to treat the technology as a tool to meet the needs of consumers, but also as a way of eradicating poverty.

The technologies needed to ensure that everyone will be able to enjoy a good quality life, to a large extent, already exist. What needs to change is how these technologies and the access to them is distributed. The world nowadays is facing **technological injustice**, since technology is aimed at satisfying the consumer rather than the needs of humanity. As Bill Gates said in a debate in 2009, it is wrong that more money is spent on finding a cure for alopecia in men, despite finding a vaccine for malaria. The transition from technological injustice to technological justice is required in order to eliminate the obstacles that now hinder poor people in using the technologies needed for the most basic tasks.

Electricity is an essential service. It is taken for granted in the Western World, but 1.4 billion people worldwide have no access to electricity: almost half the world's population continues to cook using fire stoves. Apart from the problems in collecting fuel, wasted time and inefficient burning of wood as fuel, there is a huge impact on people's health.

It is shocking that 1.4 million people -mostly women and children- die each year from the effects of inhaling smoke from traditional stoves and fireplaces used for cooking in the house. This is 50% more than the number of people who die from malaria every year. Electricity may not be directly related to the aforementioned problem. The solution may be a wood stove with clean and efficient combustion or perhaps a gas stove. It is important that there are many technological solutions to the problems that the world is facing, but those solutions are usually not affordable for poor and marginalized people who need them most.

The efforts for the improvement and the expansion of the use of technology should focus on the real needs of people, providing prosperity for all people and not only for those living in the developed world and also take into account future generations. But what does this mean in practice? Food production in developing countries provides a clear distinction between technological justice and technological injustice. Historically, the approach of many large financial institutions, used to focus on large, commercial farming units in the most productive areas of the developing world. It also supports the use of industrial agricultural technologies, such as chemical fertilizers, pesticides and mechanization.

However, such a practice, which focuses on the minority commercial farming units that have the most productive land, ignores the majority of farmers who need help to improve the efficiency of their production processes. Only in sub-Saharan Africa, 60% of the population is based on small-scale agriculture activity for making a living. Moreover, the focus on the agricultural technologies damages soil fertility over time. This is technology injustice. This policy not only ignores the needs of small farmers but also has a lasting effect on the environment and diminishes the prospects of future generations to satisfy their nutritional requirements.

To achieve technological justice we should follow a different path. By cooperating with small farmers, Practical Action recognizes that several simple improvements can help increase production and often lead to the creation of surpluses. Practical Action has been involved in several projects which are related with technological justice, whether working with small farmers for rice production in Sri Lanka, or for production of potatoes in Peru, or maize in Zimbabwe. Technology justice ensures that our environment will be preserved, e.g. with the protection of soil fertility and their ability to retain moisture. This not only ensures the livelihood of the farmers, but also of those who will live in the future.

More than one billion people worldwide do not have access to clean water which is necessary for their survival. Each year, 1.5 million children die from diseases related to water and sanitation. This fact can be considered as one of the most important technological injustices. We have both the knowledge and the technology to prevent those deaths. Technological justice should be our motto for eradicating poverty, unhappiness and misery.

Is it really possible to apply the technology justice, particularly in a world where decision-making is guided by the market economy? It is definitely a difficult task, but the circumstances are changing. Perhaps for the first time in history, two major challenges -fighting poverty and finding a sustainable future for everyone- have become a major global issue. We cannot ensure a sustainable future for any of us on the planet, rich or poor, if we do not find a way to tackle the threat of climate change and, therefore, comply with the principle of solidarity and technology justice.

Millennium Development Goals (MDGs)

In September 2000, at the Millennium Summit in New York organized by the UN, the leaders of 189 member states agreed to set specific targets for combating poverty, hunger, disease, illiteracy, environmental degradation, discrimination against women, reduce child mortality and extend global partnership for development.

Those goals which were placed as a priority on the global agenda, were called the MDGs (Millennium Development Goals). Specifically, the 8 MDGs agreed by the leaders of the 189 countries are the following:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS and other diseases
7. Ensure environmental sustainability
8. A global partnership for development

To achieve the MDGs too many public, private and non-profit entities are involved and working together and independently, both in developed and developing countries. It is a fact that the MDGs have brought the international community closer, after there was no common framework to promote global growth.

The MDGs have mobilized government and business leaders to donate tens of billions of dollars. The leaders of the UN member states agreed that developed countries should participate in the MDGs by providing adequate financial assistance to poor countries. Despite the weaknesses and shortcomings, the MDGs have been promoting cooperation between public, private and non-governmental organizations (NGOs), providing a common language and bringing together disparate entities. In his speech at the General Assembly, in 2008, the philanthropist Bill Gates called the objectives as "the best idea to combat global poverty".

Millennium Development Goals

The 8 **Millennium Development Goals (MDGs)** are divided into 21 separate measurable objectives, which are determined by 60 indicators. Below the specific objectives for each MDG are presented.

1. **Eradicate Extreme Poverty and Hunger**
   - 50% reduction in the proportion of people whose income is less than $1 a day.
   - Ensuring decent employment for all women, men and young people.
   - Reduce by half the proportion of people who suffer from hunger.

2. **Achieve Universal Primary Education**
   - By 2015, all children, boys and girls, can complete a full primary school curriculum.

3. **Promote gender equality and empower women**
   - Eliminate gender disparity in primary and secondary education by 2005 and at all levels by 2015.

4. **Reduce Child Mortality**
   - Reduce by two thirds of child mortality under the age of 5.

5. **Improve Maternal Health**
   - Reduce by 2/3 the maternal mortality ratio.
   - Universal access to reproductive health.

6. **Combat HIV/AIDs and other diseases**
   - Combating the spread of AIDS.
   - Ensuring access to treatment for AIDS carriers.
   - Reduce incidences of malaria and of other major diseases.

7. **Ensure Environmental Sustainability**
   - Integrate the principles of sustainable development into country policies and programs of countries and protection of environmental resources.
   - Reduce biodiversity loss, achieving by 2010 a significant reduction in the loss rate.
   - Reduce by half the proportion of people living without sustainable access to safe drinking water and basic sanitation hygiene.
   - By 2020 achieve significant improvement in lives of at least 100 million people in the slums.

8. **A global Partnership for development**
   - The further development of trade and financial system, based on transparent and non-discriminatory rules.
   - Meeting the special needs of the least developed countries.
   - Meeting the special needs of remote underdeveloped countries and Small Island developing States.
   - Facing the debt problems of developing countries.
   - Providing access to essential medicines at affordable prices to developing countries, in collaboration with pharmaceutical companies.
   - Accessing new technologies, especially information and communications, in collaboration with the private sector.

More information on the MDGs

MDG 1: Eradicate Extreme Poverty and Hunger

1. Reduce by half the proportion of people living on less than a dollar a day.
2. Achieve full and productive employment and decent work for all, including women and young people.
3. Reduce by half the proportion of people who suffer from hunger.

Quick facts
- The proportion of people living on less than $1.25 a day fell from 47% in 1990 to 24% in 2008 – a reduction from over 2 billion to less than 1.4 billion.
- Preliminary estimates indicate that the global poverty rate at $1.25 a day fell in 2010 to less than half the 1990 rate. If these results are confirmed, the first target of the MDGs – cutting the extreme poverty rate to half its 1990 level – will have been achieved at the global level well ahead of 2015.
- Women are far more likely than men to be engaged in vulnerable employment.
- The numbers of malnourished have stabilized since 1990.
- Progress in relieving food deprivation has slowed or stalled in many regions.
- Countries in sub-Saharan Africa were the hardest hit by the food and financial crises.
- Nearly one in five children under age five in the developing world is underweight.
- Poverty is a major determinant of undernutrition in children in all regions.

MDG 2: Achieve Universal Primary Education

Ensure that by 2015 children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

Quick facts
- Progress on primary school enrolment has slowed since 2004, even as countries with the toughest challenges have made large strides.
- More than half of all out-of-school children are in sub-Saharan Africa.
- Success at the primary level places increased demands on secondary schools.
- Illiteracy still holds back more than 120 million young people.

MDG 3: Promote gender equality and empower women

Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015.

Quick facts
- Gender parity is closest to being achieved in world primary schools, even though some regions lag behind.
- Gender disparities emerge at different points through the education system.
- Girls from the poorest households face the highest barriers to education.
- Equal access to job opportunities remains a distant target for women in some regions.
- Women, more often than men, turn to the informal economy.

MDG 4: Reduce Child Mortality

Reduce by two thirds the mortality rate among children under five.

Quick facts
- Globally, deaths within the first month of life fell from 32 per 1,000 live births in 1990 to 23 in 2010.
- Since 1990, in the developing regions, the mortality rate of under-five years old has declined by 35%, from 97 deaths per 1,000 births to 63.
- Sub-Saharan Africa has doubled its average rate of child mortality reduction from 1.2% a year during 1990-2000, to 2.4% during 2000-2010.
- Sub-Saharan Africa suffers a higher neonatal mortality rate (35 deaths per 1,000 live births in 2010) than any other region, and has recorded the least improvement over the last two decades.
- Children in the developing regions as a whole, are twice as likely to die before their fifth birthday as children in the richest 20% of households.
- Sub-Saharan Africa had a 85% drop in measles deaths between 2000 and 2010.

MDG 5: Improve Maternal Health

1. Reduce maternal mortality by three quarters.
2. Achieve universal access to reproductive health.

Quick facts

*   Poverty and lack of education perpetuate high adolescent birth rates. An estimated 287,000 maternal deaths occurred in 2010 worldwide, a decline of 47% from 1990.
*   The regions with the highest maternal mortality, Africa and Southern Asia, are also those with the lowest coverage of births attended by skilled health personnel – less than half.
*   The rural-urban gap in skilled care during childbirth has narrowed.
*   The number of maternal deaths per 100,000 live births is down from 440 in 1990 to 240 in 2010, for the developing regions as a whole.
*   While Southern Africa reported almost universal coverage in 2010, in West Africa about one third of women did not receive antenatal care visits.
*   The use of contraception is lowest among the poorest women and those with no education.
*   More than half of all women aged 15 to 49 who were married or in a union were using some form of contraception in 2010 in all regions except Sub-Saharan Africa and Oceania.
*   Fewer teens are having children in most regions, but progress has slowed.
*   Maternal health coverage has progressively increased in developing regions from 63% in 1990 to 71% in 2000, and then to 80% in 2010.

MDG 6: Combat HIV/AIDs and other diseases

1. Halt and begin to reverse the spread of HIV/AIDS.
2. Achieve, by 2010, universal access to treatment for HIV/AIDS.
3. Halt and begin to reverse the incidence of malaria and other major diseases.

Quick facts

*   In sub-Saharan Africa, annual new infections in 2011 reached 1.7 million people, including 300,000 children.
*   The number of people dying of AIDS related causes fell to 1.7 million in 2011, a decline of 24% since the peak in 2005.
*   At the end of 2011, an estimated 8 million people were receiving antiretroviral therapy for HIV or AIDS in low and middle income countries, up from 6.6 million people in 2010 and up from just 400 000 in 2003.
*   57% of HIV-positive pregnant women received treatment to prevent HIV transmission to their child in 2011.
*   The estimated incidence of malaria globally has decreased by 17% since 2000, and malaria-specific mortality rates by 25%.

MDG 7: Ensure Environmental Sustainability

1. Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources.
2. Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.
3. Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation.
4. Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020.

Quick facts

- The net loss worldwide of forests decreased over the last 20 years, from 8.3 million hectares per year in the 1990s to 5.2 million hectares per year in the last decade.
- Over exploitation of global fisheries has stabilized, but steep challenges remain to ensure their sustainability.
- The number of people who do not use any facility and resort to open defecation has decreased by 271 million since 1990. But there remain 1.1 billion people, or 15% of the global people with no sanitation facilities at all.
- The number of people using improved drinking water sources reached 6.1 billion in 2010, up by over 2 billion since 1990.
- In 2010, 89% of the world's population was using improved water sources, up from 76% in 1990.
- The share of urban slum residents in the developing world declined from 39% in 2000 to 33% in 2012.
- More than 200 million people gained access to improved water sources, improved sanitation facilities, or durable or less crowded housing.
- Slum prevalence remains high in Sub-Saharan Africa and increase in countries affected by conflict.

MDG 8: A global Partnership for development

1. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.
2. Address the special needs of least developed countries.
3. Address the special needs of landlocked developing countries and small island developing States.
4. Deal comprehensively with the debt problems of developing countries.
5. In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.

Quick facts
- Official development assistance stands at 0.31% of the combined national income of developed countries, still far short of the 0.7% UN target. The UK is one of the few countries sticking to the target of 0.7%.
- Aid to the African continent increased by 0.9% to 31.4 billion in 2011, but remains below expectations.
- Developing countries gain greater access to the markets of developed countries.
- In 2011, 75% of the worldwide mobile cellular subscriptions were in the developing regions, up from 59% in 2006.
- By the end of 2011, over 160 countries in the world had launched 3G mobile broadband services and 45% of the population worldwide was covered by a high-speed mobile broadband signal.
- The developing world share of the world's Internet users rose to 63% in 2011, when 35% of the world was online.
- Only 1 in 6 people in the developing world has access to the Internet.

Global Learning

In a rapidly changing and globalized world, education should help people to understand the wider world around them and make connections between global issues such as poverty or climate change and their lives. You need to prepare them to live and work in a global society and economy and encourage them to make the world a better place. The concept of Global Learning has been developed in this context. Global Learning is a pedagogical approach that aims to provide opportunities to students to think creatively and critically about global issues, to reach their own conclusions and to cultivate attitudes such as:

- self-awareness and openness towards diversity,
- understanding of global problems and
- actions taken for a better world.

Global Learning aims to help students to develop their knowledge, skills and attitudes in respect to how they are related in a globalized world and what they can do to reduce global poverty. As a pedagogical approach, it provides students the opportunity to study and consider the perceptions and practices of contemporary society in the western world in relation to the world's poorest countries. Global Learning promotes the development of the values of **social justice** and **solidarity**. Being a pedagogical approach, it allows to and encourages students to interpret and participate in discussions on development and report their personal experiences of the wider social and cultural environment.

Specifically, Global Learning is a pedagogical approach which:

- Is part of the understanding of global development issues and problems especially in poor countries.
- Is placed on the basis of social justice.
- Promotes critical thinking and reflection.
- Encourages students to make connections between their own lives and the lives of other people in the world.
- Promotes self-criticism and revision of attitudes and perceptions based on the principles of global solidarity between people.
- Provides opportunities to the students to have a positive and active participation in society, contributing to a better world.

Pedagogical features of Global Learning

1. Global perspective
   The participation in the learning process for global issues is based on the fact that students are interested in and studying several kind of issues beyond their study area. An important fact of Global Learning is that we live in an interdependent world, thus everything that happens has an impact on our lives as well.

2. Power and Inequality in the World
   Dealing with issues of power and inequality in the classroom can be considered as a challenge, because those discussions may raise political and ideological issues. However, when those issues are studied in a historical context, it becomes easier to understand the global economic, social, political and environmental forces that define our lives.

3. Promotion of Social Justice
   The conception of social justice is determined by a wide range of personal, social and cultural influences. This means that students' perception on global poverty is likely to be driven by factors such as education, religion, friends, family and the media.

4. Critical thinking, reflection and dialogue
   Global Learning can change students' views, prospects and lifestyles as a result of deeper learning, reflection, dialogue and critical thinking. However, the process is not linear or easy and such a transformation cannot be achieved in a short period of time.

Global Learning and 'Make the Link'

The project examines the role of technology in addressing the serious problems faced by many people living in poor communities in developing countries. The material that has been developed includes a wide range of issues, based on the pedagogy of Global Learning, enabling students to:

- Define some global issues and problems faced by some people in the world, such as the need for water, shelter, food.
- Understand some of the inequalities related with technological justice.
- Actively participate in the discussion and reflect on various global issues and reach to their own conclusions where possible.
- Learn about positive cases and examples of science and technology that are being used and developed in low economically developed countries.
- Develop ideas on how to act in life, with respect to solving various global problems.

Resources

http://www.un.org/millenniumgoals/global.shtml

http://www.undp.org/content/undp/en/home/mdgoverview.html

http://www.foreignaffairs.gr/articles/69326/john-w-mcarthur/ti-kataferan-oi-anaptyksiakoi-stoxoi-tis-xilietias?page=show

http://practicalaction.org/technology-justice

http://ec.europa.eu/europeaid/infopoint/publications/europeaid/documents/188a_mdg_el.pdf