In our current visually oriented age, science and technology education (STE) relies heavily on the use of pictures to present technical subject matter. Today’s students live in an information environment saturated with visual images and the educational materials they are presented with are no exception. Because educational materials must compete for attention in this rich visual environment, all types of teaching resources from traditional textbooks to the latest educational technologies now contain a wealth of pictorial representations. In science and technology education these pictures are very diverse, ranging from realistic drawings and photographs to highly abstract diagrams and graphs. The educational emphasis on pictures reflects the widespread use of technical pictures by practising scientists and technologists across many different fields. Both practitioners and those who teach science and technology seem to believe firmly in the old saying that ‘a picture is worth a thousand words’. The use of pictures to represent technical subject matter is not new. Ancient pictures from many different countries show that visual information has long been an important way of communicating ideas about our world and how it works. However, in more recent times there has been an explosion in the number of specialized types of graphics developed to represent scientific and technological information. These specialist representations can provide critical information about the state of our world that may have enormous social and economic implications for its peoples. For example, the science of meteorology relies heavily on traditional weather map diagrams as well as on various modern remote sensing imaging techniques. Scientists and technologists working in the field of meteorology use these sophisticated pictorial tools to help them monitor the world’s weather and so give advance warnings about potential hazards such as floods, droughts and storms.

Technological advances, particularly in computing, continually increase the range of imaging techniques that are available to the scientific community. This burgeoning use of pictorial representation has implications for science and technology education. The capacities to both understand and generate technical pictures are fundamental to scientific and technological literacy for students at many levels, from school to university. We could describe these capacities as a form of visual literacy that involves the ‘reading’ and ‘writing’ of technical pictures. It is just as important for students to develop this visual aspect of scientific and technological literacy as it is for them to develop the general literacy required to deal with the specialized verbal and mathematical languages they encounter in science. Successful reading of a highly abstract scientific diagram requires very different skills from those required for reading ordinary pictures of everyday content (such as photographs in a newspaper or illustrations in a shopping catalogue). This means it is essential that today’s students develop the general visual literacy skills required for dealing with scientific graphics. However, they must also learn about particular types of scientific pictures that actually form part of the content of a specific field of scientific or technological study. This necessity for having a range of visual skills can be shown by returning to our meteorology example. As well as being able to read scientific diagrams in general, students of meteorology also need to know how to read the various types of diagrams and images that meteorologists use to represent weather information.

Visual language

The ways pictures are used in everyday life can give the misleading impression that visual language is somehow generally much easier to understand and more universal than verbal or mathematical language. For example, international airports all around the world use various graphic symbols to present information to people from many different language groups. By avoiding the need for multiple translations, these graphics greatly simplify the task of conveying fundamental information such as the location of toilets and other facilities. However, we must remember that this information is neither very sophisticated nor specialized. It concerns basic, everyday matters that people in general are familiar with and represents them in a very straightforward way. In contrast, the
forms of visual information that scientists and technologists use are far more complex and esoteric. The specialized nature of scientific visualisations means that people do not learn to deal with them as an incidental result of their normal interaction with the everyday environment. Rather, they must engage in specific learning activities that help them to develop the knowledge and skills required to handle these various particular types of visual representation. Part of the reason for this is that the content depicted in these visualisations is quite unfamiliar to everyone except specialists in the scientific field concerned. However, there are also aspects of how content is depicted that make these visualisations challenging for the uninitiated. In particular, the depiction of the subject matter in scientific visualisations is often not meant to be taken literally (as would be the case for more realistic and everyday types of depictions). Rather, diagrams and other technical illustrations depict their content using a host of specialized graphic conventions that extensively manipulate and even grossly distort literal reality. To interpret these pictures properly, the viewer must know about these conventions and be skilled in decoding them in an appropriate manner.

Developing Visual Literacy

From the previous discussion, we can see that teachers need to develop students' capacities to understand and properly interpret specialized technical visuals. Teaching of the necessary knowledge and skills can - and should - begin when children are quite young, even before they begin formal studies of science and technology. One approach is to introduce young children to graphic conventions that are widely used in depictions such as scientific diagrams by having them devise simple drawings that actually use these conventions. However, rather than illustrating an unfamiliar scientific topic, this should be done in the context of everyday subject matter. In other words, the content of the visuals would be very familiar to the students (i.e. not "scientific") but the way it is to be depicted would be highly diagrammatic. For example, teachers could guide students through a number of stages to help them develop their own diagrams of a simple commonplace object such as a piece of fruit. Starting with the real object, the teacher could show students how to use a range of diagram techniques to devise a picture that communicates information about the object in a scientific manner. So, if a teacher decided to use an orange as the subject matter for a diagram-drawing exercise, one of the things that could be done is to introduce students to the idea of a cross-sectional view. This of course is a technique widely used in all sorts of scientific and technological diagrams as a way of indicating internal structures that are normally hidden from view. It is a simple matter to cut the orange in half, place one of the halves cut-face down on a photocopier then produce a photo-like image of the inside of the fruit. This photocopy could be the starting point for students to gradually modify the image in order to produce a more diagrammatic depiction. This would involve processes such as simplifying the image into a line drawing, omitting unnecessary detail, removing natural irregularities to produce a more "geometric" result, and identifying key parts of the structure by means of shading or colour coding. Initial activities of this type could be followed up by using objects for which dynamic change as well as structure needs to be depicted. For example, a simple device such as a plastic garden irrigation tap could be dismantled and its functioning represented diagrammatically. This type of exercise could be used to show how other diagram conventions such as arrows, dotted lines and sequential pictures can be combined with the cross-sectional convention covered in the previous example. Where aspects of the subject matter would be artistically difficult for young students to draw by themselves, teachers could even provide partly-drawn pictures so that students have only to add simple lines and shapes to complete the representation. Alternatively, teachers could provide a "kit" of pre-drawn pieces for the diagram which students would then assemble into a finished product.

Having children devise their own "technical pictures" requires a significant change in the way drawing is typically treated in primary school. In most classrooms, children either copy given pictures (provided by the teacher, textbook, etc.) or draw their own pictures as a means of self-expression. Rarely if ever are they asked to produce original drawings that provide the type of clear and precise visual explanation that is found in technical diagrams. However, it is unreasonable to expect students to acquire all the required capacities for dealing with technical diagrams by such drawing exercises alone. As students move into formal studies of science, there are occasions where the teacher needs to present them with ready-made diagrams as well as other forms of scientific images. In these cases, students' capacities for dealing with technical pictures are more likely to be developed if extensive scaffolding is provided by the teacher. For example, instead of requiring students to copy down a finished diagram, the teacher could gradually build up the depiction piece by piece in a way that emphasises the logic of the subject matter. The value of this sequential type of approach would be further enhanced by accompanying the drawing process with a suitable commentary and questioning that emphasises key aspects of the subject matter. On many occasions, students are faced with a technical picture in a textbook or other resource that is intended to explain the to-be-learned content. However, these pictures are often quite difficult for students to interpret effectively because they do not know how to "read" such pictures effectively. Just because teachers have no trouble reading a picture, we should not assume that it is equally comprehensible to students. Rather, teachers should consider providing quite explicit guidance to direct their students through the information that is depicted so they probe the picture in detail and develop an understanding of its internal logic. Supplementary exercises based on an existing picture but which require students to analyse, elaborate or modify the original in various ways can also help to improve comprehension.

Conclusion

Visual literacy is an essential component of science and technology education today. However, it is an aspect that is relatively neglected by teachers in this area. Part of the reason is that teachers generally assume that pictures are self-explanatory and always function to make their subject matter easier. Unfortunately, comprehension of the specialized pictures used in technical fields requires knowledge and skills far beyond those required for everyday pictures. In order to address this neglected aspect of science and technology education, teachers need both a better appreciation of the demands of technical pictures and a knowledge of teaching strategies that will help to develop students' visual literacies in this area. There are various ways in which teachers can be supported to help them meet the emerging needs for visually-oriented education in science and technology. The training of future science teachers should certainly...
cover this area but support is also needed for experienced science and technology teachers. At present, resources to help teachers develop visual literacy are limited and there is a great need for further work to develop practical teaching strategies and resources.

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Some relevant publications:

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Visual Learning Courses

A number of courses in visual learning have been developed at Curtin University of Technology. These courses are designed to equip teachers with a deeper understanding of the nature of visual learning while developing their capacity to develop practical teaching strategies and resources. The study programs offered allow individual teachers to work on situations that are appropriate to their own local environment and cultural context. A number of these courses are available for study by distance education. For further details, contact: Richard Lowe (address above)

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Youth and Sustainable Consumption

Consumption depends on individual choices that should be legal, affordable and socially acceptable; however, their cumulative consequences can be devastating for sustainable development on a global scale. Consumption increase does not necessarily mean fulfillment. In classic economic terms, consumption is seen as a quality; if there is an increase in consumption, there is an increase in the GNP. Immediately after the Second World War, Victor Lebow used to say that “Our enormously productive economy ... demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfaction, our ego satisfaction, in consumption ... We need things consumed, burned up, worn out, replaced, and discarded at an ever increasing rate”. Business Week has even stated “Indeed, the words consumer and person have become virtual synonyms”. The whole paradox is in the fact that to limit consumption of the wealthy people is not ethically and morally acceptable; however, keeping the same consumption levels and patterns for all mankind is not possible. Then, as says Durning, the question is how much is enough?

One example of publicity during the American recession (Range Rover): “Buy something. Our preference, of course, would be that you buy a Range Rover. But if that’s not in the cards, buy a microwave. A Basset hound. Theater tickets. A Tootsie Roll. Something”. The reasoning behind this publicity is that if no one purchases, no one sells; if no one sells, no one works. This is the traditional argument of either-or, consumption-recession. Nevertheless, how does one keep up a consumption-based society model endlessly without compromising the environment, the social equilibrium and the future of coming generations? How does one gradually move from this consumption-based economy towards a “permanence economy” rooted in the awareness of the degradation provoked by some consumption patterns and life styles?

The UNDP Human Development Report (1998) states that consumption clearly contributes to Human Development when it enlarges the capabilities and enriches the lives of people without adversely affecting the well-being of others. It clearly contributes when it is as fair to future generations as it is to the present ones. And it clearly contributes when it encourages lively, creative individuals and communities. UNDP stressed that consumption must be shared, strengthening, socially responsible and sustainable. Shared means ensuring basic needs of all; strengthening means building human capabilities; socially responsible means that the consumption of some does not compromise the well-being of others; sustainable means that it does not mortgage the choices of future generations.

In this connection, policy for consumption needs to address our economic, social and regulatory frameworks to re-forge the links between consumption and human develop-

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opment. Rising pressures for excessive consumption can turn destructive reinforcing exclusion, poverty and inequality, creating inequalities of consumption and increase of basic needs (e.g. the income needed to fulfil consumption aspirations doubled in the US between 1986 and 1994) with the result that the definition of what constitutes a “necessity” is changing. Because globalization is also integrating consumption markets, consumption options have been opened for many consumers (options depicted, for instance, in movies and television shows).

One of the main UN goals is to move to more sustainable consumption patterns and discourage patterns of consumption that have a negative impact on society. For instance, ensure minimum consumption requirements for all; develop technologies and methods that are environmentally sustainable for both poor and affluent consumers; remove perverse subsidies and restructure taxes that damage the environment; strengthen public action for consumer education and information and environmental protection; strengthen international mechanisms to manage the global impacts of consumption; build stronger alliances among movements for consumer rights, environmental protection, poverty eradication, gender equality, and children’s rights; think globally and act locally (and vice-versa).

Thus, continuing past trends, with little change in consumption patterns particularly among youth, or production technologies, would reinforce some of today’s most basic human problems. The message of Kabelvåg is clear: consumption can be far more efficient principally if individuals, companies, local authorities and countries succeed in wasting less. Sustainable consumption initiatives need to go beyond moral exhortation and demonstrate the value that sustainable consumption brings about, for instance, trying to move the sustainable alternatives from the margins to the mainstream.

A Commission on Sustainable Consumption within the Oxford Centre for the Environment, Ethics and Society, has been formed, with a mandate to look specifically at the socio-cultural dimensions that shape consumption patterns. The Commission tries to define consumption not only within its ecological limits, “but within a wider understanding of modern institutions ‘and societies’ essential need to reproduce social meanings, solidarity and systems of communication…the narrow environmental view does not recognise that consumption (rather than production) now provides expanding scope for people to define themselves, express who they are and modify how others perceive them”. 3

Youth deserves special attention when considering consumption patterns. Young people make up an important target group within the demand side in this consumer society and play a determinant role in future consumption patterns. Yet they should not only be regarded as “victims” of a contemporary consumer culture. Sometimes young people are more concerned about the future of the earth they will inherit and thus their voice should be heard. Moreover, there are some groups of young people who are taking initiatives in proposing alternatives to this “consume more” trend. They can be messengers of a new approach that can involve their peers, as well as adults. Therefore, understanding consumption patterns of younger generations is of great relevance for the analysis of macro policy and economic trends world-wide.

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STEE Worldwide

GENDER AND TECHNOLOGY EDUCATION IN U.K.*

Technology in the Curriculum in English Schools

Technology is a relative newcomer to the curriculum of even secondary schools. Its arrival, and its discrimination from technical education, are recognition of the pervasive influence of technology on modern life and the prosperity of nations. This requires populations who are skilled in living with, managing and contributing to, technological development.

But the form that technology education should take continues to be controversial, not only in the UK, but in other parts of the world also. Inevitably, the final outcome is dependent on the views of dominant pressure groups but also on the skills, identities and self-perceptions within the available teaching force, on existing accommodation and equipment and related programmes offered in the past.

The antecedents of technology education in England are threefold: applied science courses (used by pupils considered to be academically able), handicrafts (offered to younger pupils and pursued by the ‘less able’) and computing, which had entered the curriculum on an ad hoc basis as computers became available in schools.

All three antecedents of technology have been sex differentiated in the past. They have been the most strongly gendered of all curriculum areas. In the early 1980s public examinations taken by 16 year olds showed girls formed less than 3% of entries to woodwork or metalwork; slightly more boys participated in domestic subjects (3-9%). A survey at that time of more than 50 schools in two Local Education Authorities showed that, in what is now Key Stage 3 (years 7, 8 & 9), only 25% of schools included continuous strands of Craft, Design & Technology (CDT) and Home Economics for all three years. The most common form of organisation was a

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2 Report "Consumption in a sustainable world" (Kabelvåg, Norway, 1998)
3 Report on ESRC project on sustainable consumption and lifestyles 1999

* The full text of this article is available on Connect website (address last page)
 compulsory rotational scheme of ‘taster’ courses in ‘creative studies’ for the first year of secondary schooling. The courses were of 8 or 9 sessions and included CDT, Home Economics, Art and, sometimes, Music. Optional courses would then be offered in the second and third years.

By the early 1990s some progress had been made in breaking down stereotypes: in 1992, 21.5% of CDT entries were from girls and 13.8% of Domestic Subjects entries were from boys, with girls gaining a higher percentage of grades A-C in both. A National Curriculum for 5-16 year olds was progressively introduced to schools during the 1990s, considerably reducing choices made at age 13/14. This included science as one of three ‘core’ subjects and technology as one of several ‘foundation’ subjects. Technology is currently examined at 16+ as ‘Design and Technology’ and ‘Technology’. The first has the largest entry, with roughly equal participation by boys and girls, but it contains internal options, two of which relate to food or to textiles. Girls generally choose these, while boys choose workshop-related options.

Computing, or Information Technology, has but a brief history in schooling in England, but it has become gender-stereotyped. Before computers were available in schools and homes women formed more than 30% of students in undergraduate Computer Science courses, but over the 1980s their participation dropped to less than 10%.

**Does it Matter?**

In discussing this question Head (1980) makes three points: one is an equal opportunity argument - women’s earnings are considerably less than men’s, which is partly due to their lack of technical qualifications; another relates to skills shortage - although girls and women have the ability to work within science and technology, few qualify to do so and the third relates to the nature of technology education - this has been presented too often as intensive-ly narrow and divorced from human concerns. Within this framework girls have been defined as deficient. Head claims that the failure to attract girls is a failure of technology education, not of girls.

If we look more closely at this last point we can ask: whose world views are more usually represented in the practice of technology and in its presentation for learning? The answer, of course, is that of men and boys. Because society currently maps different roles onto men and women and expects different behaviours from them, males and females tend to develop different value systems and world views. Concerns of males include achievement, leadership, control and independence; those of females include care, nurturance, relatedness and personal responsibility. If women do not work within technology the values associated with them will not be strongly represented in technological development, which puts people and the planet at risk.

**Facilitating Girls’ Participation and Success in Technology Education**

The Assessment of Performance Unit (APU) was set up within the then DES (Department of Education and Science) in the late 1970s, to establish standards of performance in the major subjects of the curriculum at ages 11, 13 and 15. The APU Design and Technology, a late comer to the scheme, operated only in the second half of the 1980s, with a brief to monitor the capability in design and technology of 15 year old pupils. It defined design and technology as ‘a purposeful, task-related, activity that results in ‘improvement’ in the made world’ (while recognising that the concept of improvement was problematic, depending on a set of shared values). Assessment activities were developed. Each was divided into sections within which short tests were devised to assess capability. Some clear gender differences in performance emerged (SEAC, 1991): Using reflective skills. It was found that tasks requiring reflection (e.g. the identification of a need, or the evaluation of a product) enabled girls to participate with confidence and to demonstrate good capability, whereas ‘active’ tasks favoured boys.

Recognising context. In general, girls out-performed in a ‘people’ context and boys in an ‘industry’ context; no clear gender difference was found in an environment context.

Valuing the social context. In particular the social context supports girls’ performance and their readiness to be involved.

Recognising complexity. The reluctance girls show in abstracting aspects of a problem from its context means that they often recognise a greater complexity in a given situation. Perhaps this is why it was also found that a tight structure to the activity supported girls’ performance. On the other hand a loose task, one in which they could decide meanings and priorities, also favoured girls.

Differing teaching and learning styles. Following the Nuffield Science Projects of the 1960s and 70s a study of teaching styles and related pupil attitudes to, and achievement in, science was carried out. Three teaching styles were identified: the Informer (I), the Problem Solver (II) and the Inquirer (III). Style I was the least successful, even in knowledge gains. Style II (a style wherein the teacher dominates) was used more by men than by women teachers; in it pupils were publicly challenged to hypothesise solutions to problems from data given verbally or from experimental work. This style was most successful in generating knowledge. Style III was more pupil-controlled, in which pupils investigated problems, often formulated by themselves, in small groups. It was used more by women than by men teachers, it produced highest levels of achievement in problem solving tasks, its knowledge gains were close to those of Style II and it was the only style in which the pupils’ attitudes to science showed positive gains over a year.

**Barriers to Participation and Achievement**

Some barriers may be deduced from the evidence given above. Problems may be created for girls by disregarding the special (and valuable) skills they employ in the learning process. Other specific examples of barriers are given below.

Girls’ attitudes? If girls’ attitudes to science and to technology are interpreted as negative, this will be conveyed to them in a number of ways by comment and by attempts to change their attitudes without changing the ways science and technology are presented. Most surveys of attitudes to technology conclude that girls’ attitudes are less positive (more negative) than boys’.

Teachers’ behaviour. The GIST project found that most science and technology teachers regarded girls’ low participation in science and technology as unproblematic, and not a serious professional issue (Whyte, 1986). This assumption still holds in many parts of the country. Many teachers have different expectations of girls as compared to boys. The author finds that teachers participating in in-service training on equity issues will consistently counsel Denise differently from Denis, using the same pupil profile. Spear showed that teachers given copies of pupils’ work in science graded it higher and predicted a
brighter future for a pupil if it carried a boy's name, than if the same piece of work bore a girl’s name (Spear, 1984). The GIST project also observed men teachers using what may be called mildly flirtatious behaviour to jolly girls along and create rapport, thereby reinforcing gender differences in the classroom (Whyte, 1986). Boys’ behaviour. Many of the classroom interactions observed in laboratories and workshops in the GIST project seemed to have the effect of ‘edging girls out’ (Whyte, 1986, p. 25). In class discussion boys tended to call out their contributions while girls kept to the rule of raising their hand to answer. Boys would mock a wrong answer from a girl or groan at a right answer. Boys used equipment to generate aggressive play, using ray boxes as ray guns, spring balances as catapults and magnets for tug-of-war. Where resources were in short supply it was mainly the boys who elbowed their way to acquire them. Society’s expectations. The expectations of society continue to be strongly sex-stereotyped with little recognition that its gendered nature constrains the potential development of both males and females. Boys may reject activities with a female or feminine association and girls feel less than comfortable when a masculine bias, often unrecognised by teachers, is present. Where choice of participation is offered, stereotyping operates to reinforce the gendered nature of society. In Britain further changes have been made to National Curriculum requirements. Technology is no longer a compulsory subject for study at Key Stage 4. At the other end of the 1990s, as an attempt to counter the disenchantment with schooling shown by some young people, General National Vocational Qualifications (GNVQ) have been introduced into Key Stage 4 in English schools. The choices of courses made within this programme are extremely gender stereotyped, with more than 90% of participants in ‘Health and Social Care’ and in ‘Childcare’ being female and more than 90% of students in manufacturing and engineering courses being male.

Conclusion
Technology education and its antecedents have been strongly sex differentiated and gender-stereotyped. Research has provided insight into the obstacles to participation, mainly for girls, and to ways in which their participation may be supported. This requires the recognition of different ways of working and generating knowledge and the valuing of the special skills girls may have developed. The frameworks adopted within curricular materials and the suggestions made for presentation for pupils may facilitate gender-inclusive experiences. However, much will depend on the mediation of classroom teachers, in their projection of assumptions and their management of classrooms, including the behaviour of boys. This points to the need for substantial in-service programmes in gender-awareness for teachers of Technology.

It is, however, unfair and unwise to place all responsibility for gendered participation and outcomes onto technology teachers. The curricular frameworks must facilitate gender-inclusive participation. The ethos of schools and their policies must challenge gender stereotyping. This requires gender-awareness training for all personnel involved in education if the constraining effect of societal expectations on young people are to be modified.

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References

Talent and Creativity in Science and Innovation
A Cuban perspective

A s can be seen throughout human history, scientific development is of great importance since science and innovation have been at the root of social progress and improvement in the quality of life. The existing levels of inequality in the world today can be seen clearly in the area of scientific development at the international level. Developed countries have a high level of scientific potential as shown by Japan with 4.1 scientists for 1,000 people; Israel with 3.8; USA with 3.7; and the European Union with 2.7. In contrast, in Latin America the situation is completely different with only 0.3 scientists for 1,000 - Cuba being an exception with 1.8. One of the factors that could help to remedy such a situation is the identification and stimulation of talent. As concerns Cuba, research on talent in the educational and professional fields is important in order to help convert Cuban science into a motor force for economic development which would contribute to a sustained improvement of people’s quality of life. In Cuba, the subject is of great interest because it is believed that scientists are the future of the country - whence the importance of early detection and stimulation of talent with adequate follow-up throughout life.

But the social position concerning this subject is ambiguous and controversial. On the one hand it is recognized that society needs more and more qualified people for scientific development. But at the same time, pretexting elitism, there is resistance to the idea of providing only likely candidates with the necessary education - and at the same time to the fact that working with all the people for the development of all is very difficult. Such ambivalent positions of acceptance and rejection are present both in the minds as well as in practice.
In the educational field, talented students are the least understood and form the most disregarded group. Many specialists in this field wonder why mentally retarded persons should be paid greater attention than gifted ones when the latter also form a group with special educational needs. This is why is necessary to analyse, probe further into this subject and establish scientific criteria for the detection and stimulation of talent in diverse areas like science and innovation. In order to develop and/or implement programmes for the detection and development of talent and creativity, it is necessary to keep in mind certain fundamental ideas that are vital for the understanding of the nature of talent. In the first place, talent is a complex subject, determined by diverse causes and factors and can therefore be viewed from various angles: philosophical, biological, sociological, psychological and pedagogical. The period, society and culture of each region condition the parameters for distinguishing talented subjects resulting in a variety of definitions and models. Until the present day, no single theory has been able to explain simultaneously the heterogeneity and the diversity of cases presented nor the differences and similarities between, for instance, talent for science, arts or management nor the atypical case of Einstein, his genius, precocity and its late expression.

Talent is not a feature that remains stable lifelong. It can manifest itself in the early years and then die out or vice versa. It may remain lifelong or never make itself felt. All this depends on various factors like cognitive resources, personality traits or conditions of the medium. To be talented, rather than an unusual development what is essential is an above-average level of cognitive components. After this, and given a minimum of favourable social conditions, the determining factor is the productive attitude of the subject with regard to circumstances as well as to oneself - all of which is determined by motivational and volitional factors.

EVERYONE is potentially talented - what is necessary is to locate the precise area in which one is talented. H. Gardner describes as crystallisation of the experience, the moment when a person realises the field or the activity in which he/she is talented.

Certain spheres of human activity like dance, music and sports require a “biological” potential whereas others - intellectual ones - need a more “social” potential. But there are also those who believe that an interaction between both, the biological and the social, are necessary. However, it has not been possible to determine the percentage that depends upon heredity and that which depends upon the environment although obviously the former is predominant. Generally speaking, the current panorama is vast, varied and controversial because of the variety of existing viewpoints on the identification and stimulation of talent.

Traditionally in schools, talented students are attended to in one of the three following ways: 1) Acceleration, i.e. precocious admission or jumping grades, which contains a certain psychological risk since the student is grouped with older students and this is prejudicial. This method is accepted in higher education. 2) Segregation, by means of special schools or classes, which means labelling students with the attendant risk of identification errors; and 3) Enrichment, through intra- and extra-curricular attention, the most acceptable option with no negative implications.

Research on talent for science and innovation is all the more important that the topic has not been sufficiently explored. In order to reach a high level in it, specific cognitive as well as motivational and voluntary characterististics must be developed. Cognitive qualities can be general or specific - the latter varying according to the chosen field. Within the former can be found three types of intelligence: analytical, synthetical and practical, as well as a type of legislative and global thinking - to mention only two of the most important aspects.

Professional success in science (and in other spheres as well) requires that students concentrate their energy in one direction with a high rate of personal implication in order to reach an objective because motivational and volitive factors are the ones that allow the optimisation of capacities and the attainment of high implementation levels. In this process, the potential is developed through hard training, practice and dedication to study in the chosen area, which can spread over a period of 1-2 decades.

Among the “constants” encountered in the study of talented scientists is a very high level of dedication to work added to intrinsic motivation. By selecting careers that give them an opportunity for personal creative achievement, they often tend to find their principal source of gratification in the professional sector of their lives.

From an intellectual standpoint science is a challenging field of knowledge and requires an exceptionally high level of dedication and time in order attain to competence. One has to be ready to devote oneself exclusively to one’s work during periods of intensive labour. In a scientist’s professional life, teachers play a transcendental role basically through emotional support. Women are faced with diverse cultural and social obstacles in making their way in scientific fields since family and environment - among other things, play an important role in their lives.

The criteria for determining professional achievement in this sphere are: number of publications proportional to age, international prizes and distinctions, significant contributions to the advancement of the subject and general recognition in the field e.g. citations in noteworthy publications, practical applications of findings, time spent in international work.

Age is no barrier to the development of talent although there are certain constants. For example, artistic talent as compared to scientific, is expressed at a relatively younger age. In the latter, talent for maths and technology is expressed earlier than in the case of the social sciences where, given the amount of knowledge that is needed to make significant contributions, it is only towards 40 - 45 that one attains full creative capacity. Also, the social sciences being more “diffuse” than the natural or exact sciences, one requires more socio-historical experience.

To maintain scientific creativity it is necessary not to allow the exploratory activity and the predilection for novelty to diminish with the passage of time as increasing experience has a tendency to dull the stimulating effect of research. Increasing management responsibility can also diminish productivity.

The process of identifying talented subjects or people’s potential is very complex because, among other things, talent is not a stable feature. No single diagnostic technique can guarantee good results and high-level predictions are always imprecise though not impossible. Science is constantly searching for more accurate tools of prediction for identifying persons for the greatest capacity in science and technology.

In this context, it is important to take the nature of each subject into account. Chess, for example, like classical music is a “pure” subject since both have remained
UNESCO Activities in STEE

UNESCO/U N E P Research Project on Youth, Lifestyles and Consumption Patterns

UNEP and UNESCO have launched a research project on Youth, lifestyles and consumption patterns, which aims to improve understanding of consumption behaviour, values and patterns of urban youth. UNEP had launched a campaign on Youth and Sustainable Consumption in 1999 with the goal to investigate the role of youth in promoting sustainable consumption, engage a global process of consultation on this topic, and set up actions to promote sustainable consumption among youth. This UNESCO/UNEP research project on young people’s consumption behaviour is understood within the above-mentioned campaign as well as a larger frame of UNESCO’s efforts to promote education for sustainable consumption. It is an inter-sectoral project which is jointly implemented by: Educating for a Sustainable Future (EPD), Management of Social Transformations (MOS T) and Youth Coordination Unit (UCJ).

Its main objective is to advocate for the need to integrate consumption patterns and life styles as a key priority issue in the agenda of educational, scientific and policy-making communities through a coherent partnership with UNEP; the UNEP Youth Advisory Council; SIFO, the Norwegian National Institute for Consumer Research; ANPA, the Italian Environment Agency and Consumers International. Together with UNEP, UNESCO will contribute to identify some aspects of consumption patterns of urban youth in developing and developed countries. Issues to be addressed in collaboration with UNEP are, among others:

- what are the values that underlie consumption patterns of youth in selected countries?
- how do urbanization and social values influence consumption patterns?
- what is the effect of mass media, marketing and socio-cultural trends on youth consumption patterns?
- examination of the advertising industry mechanism and its impact on youth consumption behaviour (drawing, for instance, on the UNEP seminar on advertising, marketing and media)
- analysis of youth consumption patterns, behaviour, aspiration, purchasing power.

As a result of this first phase, UNESCO and UNEP, with other partners, will have:

a) identified preliminary sustainable consumption trends among youth, presenting some regional macro-political and socio-economic analysis on the links between consumption patterns of the youth and policy-making, as well as analytical dimensions of areas (in education, research and advocacy) for future action.


b) identified partners and setting up of a coherent joint strategy for future policy development. Output: a comprehensive project document validated by a UNEP/UNESCO workshop (by October 2000), with a logical framework and a stakeholders’ analysis. The inter-generational dimension (behaviour of the youth versus decision-making power in policy formulation) will be a key element addressed by workshop participants.

Based on the partnerships formed as well as the priority issues identified during the first phase of the project, UNESCO will foster the understanding of the socio-economic and socio-psychological dimensions of sustainable consumption patterns of the young people and their macro-political and economic links through a second phase of a more in-depth research in four selected countries. As a result of this second phase, UNESCO will have:

- drawn clear-cut policy conclusions in the field of sustainable consumption
- identified sectoral and non-sectoral policy needs addressed to the four selected countries
- identified factors that improve the use of research on sustainable consumption patterns and life styles in social policy
- developed a coherent Information, Education, Communication (IEC) strategy on sustainable consumption among youth, with clear implications for the different sectors of UNESCO
- developed IEC material.

Carlos Milani, UNESCO/MOST (c.milani@unesco.org); Miki Nozawa, UNESCO/UCJ (m.nozawa@unesco.org); Julia Heiss, UNESCO/EPD (j.heiss@unesco.org), (address last page)
UNESCO/OREALC activities in STEE in the Latin America and Caribbean region

In the course of 1999, UNESCO/OREALC undertook a series of activities for teachers and promoters of science and technology education in the Latin America and Caribbean region. In cooperation with regional NGOs and relevant associations, the subregional project for the promotion of science education - covering Argentina, Bolivia, Paraguay and Uruguay - was further developed. Throughout the year, evaluation of primary and secondary level educational institutions in Chile was conducted at their own request in order to improve the training of teachers. The following are two distinct activities in which UNESCO/OREALC made a major contribution.

Meeting of University Rectors and Directors of Science Teacher Training Institutes

Santiago, Chile, 21 June 1999

This meeting was organised by UNESCO/OREALC in the framework of an agreement of collaboration concluded in April 1999 between UNESCO/OREALC and the University of Alcalà, Spain, for the improvement of science teaching in the Latin America and Caribbean region. The meeting was attended by representatives from the following universities:

- Universidad de Cuyo, Mendoza, Argentina
- Universidad de Costa Rica, Costa Rica
- Universidad de Santiago, Cuba
- Universidad de La Serena, Chile
- Universidad de Alcalà, España
- Universidad Autónoma de Madrid, España
- as well as the Asociación de Universidades del Grupo Montevideo, AUGM and UNESCO/OREALC.

The objectives of the meeting were:
- to create a network of Ibero-american universities and experimental sciences teacher training institutes;
- to identify the needs of each one of the participating countries or sub-regions in the area of science teaching;
- to plan activities and define modalities of cooperation between the different entities of the network.

The outputs of the meeting were:
- Declaration and written commitment by the rectors to give prime importance to the question of science teacher training in developing the activities of their universities.
- Approval of the decision to create a UNESCO Chair in Science Education for Latin America and the Caribbean (The Chair was effectively created in December 1999 - a very significant result)
- Workplan of the following major themes: pre-service teacher training; in-service and continuing teacher training; highly specialised human resources training; research in science teaching; production of teaching/learning materials and preparation of new curricula for the region.

International Seminar on Science Teaching

Havana, Cuba, 6 - 10 December 1999

This seminar was organised by the Instituto Pedagógico Latino-americano y Caribeño (IPLAC)/ UNESCO Chair in collaboration with the Universidad de Valencia, Spain, Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura (OEI) and UNESCO-OREALC. It comprised lectures, courses and workshops for research workers, teachers and teacher trainers on improving the teaching of natural sciences. Cuba having developed a very interesting programme in this area, teachers from the entire Latin America and the Caribbean region are invited once a year to participate in their work.

The seminar was attended by 120 research workers, professors and teacher trainers from Latin American countries as well as Spain together with representatives of the OEI and UNESCO/OREALC. The objectives of the seminar were to:
- facilitate updating and training of teachers and teacher trainers
- disseminate research results and innovations in this field
- promote interchange of teaching/learning materials

The major results of the seminar were:
- Extensive interchange of information, views and opinions in the workshops and courses
- Possibility for a large number of Cuban teachers to attend the open lectures
- Publication of the proceedings of all the workshops and courses for wide dissemination

Further information on both activities from: Ms Beatriz Macedo, Regional Specialist, UNESCO/OREALC, Enrique Delpiano 2058, Casilla 3187, Santiago, Chile.
Fax: (56-2) 655.1046
E-mail: unesco@unesco.cl
Worldwide the path towards successful implementation of sustainable development has many hurdles and challenges. One of the most important is the development of environmentally responsible attitudes and behaviours in children and young adults before they enter the world of work and family responsibilities. Too many students, particularly in the African region, are leaving secondary and post-secondary systems without the necessary tools to make critical choices about environmental implications of their attitudes and actions. Those critical choices are even more affected in parts of the world where increasing poverty, unemployment and lack of income generation opportunities are dominating day-to-day activities of the population.

All of us realize that social, cultural, economic and technical development will continue and must continue. Yet the need for an environmentally responsible citizenry has never been greater. Existing and future demands placed on the environment be so powerful that they threaten developing economies, cultures, social structure and ecological stability. These threats will grow unless children and young adults are helped - in an action-oriented way - to develop the required knowledge, skills, attitudes and behaviour necessary to sustain their lives.

In this context, setting up a network for the Eastern and Southern African region to promote Environmental Action Learning (EAL) was the objective of organizing a regional workshop held from 24 through 28 August 1999 in Nairobi, Kenya. The Kenya Organisation for Environmental Education (KOEEE), the German Commission for UNESCO, and the Environmental Education and Training Office of UNEP brought together more than 70 decision makers, teacher trainers and teachers of 14 Sub-Saharan African countries. Participants were familiarized with teaching techniques in EAL, curriculum development and networking. Special emphasis was put on action-oriented teaching and presentation methods, which comprised traditional genres such as drama, poem or role playing. One entire day was spent "in the field". Trips to a local composting initiative, to the Nairobi river water quality monitoring initiative, and to Oloolua forest for a bio-diversity protection project were arranged. Participants also had the chance of participating in "hands-on-activities" for application back home in their own eco-school projects. Moreover, a theoretic background was provided too. The vast experience and knowledge of UNESCO’s Associated Schools Project (ASP) as well as the European Eco-school programme acted as solid basis for establishing model Eco-schools in Africa.

The workshop was an eye-opener and starting point to closer collaboration of key players in the field of education for sustainability. It has proved to be most successful in demonstrating that there is a common basis for cooperation in Africa and that this region can make valuable contributions to the enhancement of Agenda 21. A major goal of the meeting was achieved: To build capacity for Environmental Action Learning in the region. Trainers and other environmental educators as well as policy makers of both formal and non-formal environmental education were equipped with knowledge, techniques and strategies of implementing the Eco/ASP programmes in harmony with local agendas in their countries.

The core of an African environmental action learning network was set up during the workshop in Nairobi. This network needs to be thoroughly maintained and extended, e.g. by establishing model eco-schools in more African countries which, at the same time, may function as training centres for principals, teachers, media workers, community leaders and other educators, who will then train their peers - a process worth of support by international cooperation and partnerships.

Henning Peter Nieboer,
University of Trier/
Christian Holger Strohmann, UNEP

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STEE Centres, Networks...
The SMARTER Network
Science and Mathematics Resources towards Education Reform

Science and mathematics education (SME) is widely regarded as one of the key factors in personal, societal and economic development. However, determining how best to make improvements in different country contexts is a complex challenge, partly because knowledge about and experience with successful SME reform often remains tacit. This is particularly so in the case of developing countries. The SMARTER network aims to become a global resource, capturing and making explicit the accumulated body of relevant knowledge and experiences. Initiated by the World Bank and DECIDE
NACONEX

A Europe-wide project

The NACONEX (Nature Conservation Exchange Experience) is a project whose ultimate objective is the improvement of European nature conservation by spreading knowledge and skills among conservation workers in different countries. By transmitting knowledge and skills developed within specific areas of Europe to selected professionals from a range of European countries, the project contributes to the acquisition of new skills on a wider European scale. Its target group consists mainly of professionals working on nature protection in official institutions and small consultant groups. It also includes, to some extent, researchers and recent graduates. Its activities, which are mostly carried out in the framework of the Natura 2000 Network, include:

• Two training courses for nature conservation practitioners: Sweden, 13-19 June 2000; and UK, April 2001.
• Publication of two textbooks related to the topics of the courses in both English and French
• Elaboration of a glossary of conservation terms in various European languages

The project is coordinated by Pro-Natura (Sweden) in partnership with Avenir (France), NEPCom (Denmark) and The Corporation of London (UK) and receives Leonardo da Vinci funds from the European Community.

For further information contact:
Pro Natura, Halnagården, 54593 Töreboda, Sweden. Fax: 46(0)506.143.01
E-mail: naconex@pro-natura.net
http://www.pro-natura.net/naconex

Doing it & Telling it

Keeping Our Water Resources Clean

India

Place: Tagore Public School, Jaipur, Rajasthan.
Target Groups: 1,200 school children of 10-16 years.
Introduction: A National Environmental Awareness Campaign Project sponsored by the Ministry of Environment and Forests of the Government of India was taken up to raise awareness about keeping our water resources clean. The project aimed at giving intensive information about different impurities in water, their impact on the life of human beings, plants and animals and how to do away with them.

Objectives:
• Arousing awareness among children about keeping the water resources clean
• Informing children of diseases due to polluted water
• Providing knowledge of impurities and possible purification techniques

Resources: Financial aid for the project amounted to Rs 10,000 (± US$ 250). Technical guidance was provided by officials from the State Water Supply, donors etc.

Methodology: Lectures and talks as well as film shows were organised on the problem of clean water. These were followed up with essay, slogan, poster and elocution contests in order to motivate and involve students of grades 5-10. A campaign with slogans was organised in the area to raise awareness among
Readers are invited to send us their **FIELD experiences in Science, Technology, Environmental Education activities** involving the teaching/learning process - but not necessarily limited to students and teachers. They should be as brief as possible and set under the following headings:

**Place:** Locality where the activity was carried out

**Target Groups:** For whom the activity was intended

**Introduction:** Background information - reasons for initiating the activity

**Objectives:** What was the activity expected to achieve?

**Resources:** Materials/funds needed for the activity

**Methodology:** The way in which the activity was carried out

**Evaluation:** How was the activity judged? By whom?

**Results:** Did the activity produce any concrete changes in the target group(s)?

Selected experiences will be published with the name and address of the author. Please address your contributions to: **Doing it and Telling it** (address on last page)

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**News & Publications**

**2001 TYLER PRIZE**

for Environmental Achievement

The John and Alice Tyler Prize is awarded for environmental science, energy and medicine conferring great benefit upon mankind. The annual award is US$ 200,000.

Citizens of all nations are invited to nominate individuals or institutions of any nation who have benefited humanity in fields associated with environmental science, energy and medicine. **Self-nominations are not accepted.**

Deadline for receipt of nomination forms: **20 September 2000**

For nomination forms and further information contact: Dr Jerome B. Walker, Executive Director, The Tyler Prize, Office of the Provost, University of Southern California, 3551 Trousdale Parkway, 102, Los Angeles, CA 90089-4091, USA. Fax: 213-740.1313. E-mail: tylerprz@usa.edu  http:www.usc.edu/tylerprize

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The WWF/UNESCO/Kew Initiative on Ethnobotany and Sustainable Use of Plant Resources, **People and Plants**, (v. Connect, vol. XX, No.1, March 1995) is in the process of editing the People and Plants database containing nearly 4,500 individuals and institutions. The initiative which has been producing the People and Plants Handbook, Working Papers and People and Plants Online (available at [http://www.kew.org.uk/peopleplants](http://www.kew.org.uk/peopleplants)) is due to come to an end in its present form end 2000. But before that it plans to produce several more issues of both the Handbook and Working Papers. The first 3 issues of the Handbook have also been translated into Spanish under the title Cuadernos de Pueblos y Plantas. For more information contact:

Gary J. Martin, Ph.D., People and Plants Initiative, BP 262, Marrakesh-Medina, Morocco. Fax: +212-4-329544  E-mail: peopleandplants@cybernet.net.ma

**Réseau IDée** has launched a website A l’Eau! A l’Eau! (Water! Water!) aimed at a large public from age 10 onwards. Informative, educational, ludic and interdisciplinary, it proposes answers to commonly asked questions on water such as: Where does tap water come from? Is it always drinkable? How
does one reduce water consumption? A useful educational tool, it presents water in an interdisciplinary perspective inciting reflection and modification of attitudes concerning water; providing access to educational information and exploring various themes through games or animated sequences. Also provides access to a data base on documentary and educational resources on water and EE. In French. Http://www.wallonie.be/dgrne/education/eau
Europa Publications have announced the publication of the third edition of The Environment Encyclopedia and Directory for November 2000. More information on availability, price etc., from:

ICME-9, International Congress on the Teaching of Mathematics, will take place in Makuhari/Chiba, Japan, from 31 July - 7 August 2000. Further information from: bhodgson@mat.ulaval.ca
VII Conference of EE in Europe: CEE Italy 2000 will focus on networking in EE and will take place in Villa Mairin, Italy, 20-26 September 2000. Further information from: LaREA, P.zza del Castello 7, 33010 Colloredo di M. A. (UD), Italy. Tel: ++39-0432-889014 Fax:+39-0432-889798 E-mail:larea@cifra.uniud.it http://www.larea.uniud.it
ARTEFACT, the Centre for Appropriate Technology and International Development Cooperation, will hold a Theory-Practice Workshop for decision makers in North-South cooperation on Adaptation of technology for sustainable project development in Glücksburg/Ostsee, 2 - 6 October 2000. Further information from: ARTEFACT e.V., Bremsbergallee 35, D-24960 Glücksburg, Germany. Fax: 04631-6116-28
Eighth EURISY Youth Forum: Space Technology's Contribution to Transportation, Lucerne, Switzerland, 2-5 November 2000. For more information contact: Eurisy, 3-5 rue Mario Nikis, 75015 Paris, France. Fax: +33-1-47.34.01.59 E-mail:eurisy@micronet.fr

Stockholm Junior Water Prize

Since 1997, the Stockholm Junior Water Prize is awarded internationally to young people up to the age of 20 who have completed a water-related project. Projects can be done individually or in a group and may focus on a local, regional or global problem. The prize worth US $ 5,000 is presented at a ceremony at Nybrokajen II during the World Water Week in Stockholm.
For further information contact: Stockholm International Water Institute (SIWI),Sveavägen 59, SE-11359 Stockholm, Sweden. Fax:+46-8-522.139.61 E-mail: siwi@siwi.org http://www.siwii.org

The University of Auckland and Auckland Institute of Technology will organize TIME 2000, an International Conference on Technology in Mathematics Education, in Auckland, New Zealand, 11-14 December 2000. Further information from: Barry Williams, Centre for Continuing Education, The University of Auckland, Private Bag 92019, Auckland, New Zealand. Fax: 64-9-373 7419 E-mail: m.thomas@math.auckland.ac.nz http://www.math.auckland.ac.nz/TIME2000
The University of the South Pacific (USP) have initiated an innovative postgraduate course focusing on how islands might be affected by climate change. The course was developed in 1998 at the University of Waikato’s International Global Change Institute (IGCI) in partnership with the South Pacific Regional Environment Programme’s (SPREP) Pacific Islands Climate Change Assistance Programme (PICCAP) and UNITAR. The course will deal notably with scientific assessment of how climate change will affect water, health, coastal erosion, agriculture, forestry, marine and land ecosystems, national cultures etc. This information will be fed into a computer model which will detail how specific changes in climate or sea level would affect various sectors in each country. For further information contact: South Pacific Regional Environment Programme (SPREP), PO Box 240, Apia, Samoa.

Conferences, Meetings, Courses...

The two principal documents of the World Conference on Science, Budapest, 1999, Declaration on Science and the Use of Scientific Knowledge and Science Agenda - Framework for Action, which were fully endorsed at UNESCO's 30th General Conference and transmitted to the United Nations, are now available on UNESCO's website at: <www.unesco.org/science/wcs>
Nature’s Place: Human Population and the Future of Biological Diversity, by Richard P. Cincotta & Robert Engelman (2000, 80 p., US$9 - for industrialized countries) is a well documented and presented publication of Population Action International with maps, charts, figures and facts. Succinct and easy to read with abundant references, it should prove a useful resource for educators as well as those interested in environment and population matters. Order from: Population & Environment Program, Population Action International, 1300 19th Str., NW - Second Floor, Washington DC 20036, USA. Fax: 1-202-728.4177 E-mail: atalbot@popact.org

The Proceedings of the 1st session of the World Commission on the Ethics of Scientific Knowledge (COMEST), Oslo, 28-30 April 1999, have been published. Apart from opening and closing addresses and reports of sessions, contains notably contributions on Ethics and Energy, Ethics and Freshwater Resources, Ethics of Space Policy and Ethical Norms for the Information Society. Available from: Division of Ethics of Science and Technology, UNESCO, 1 Rue Miollis, Paris 75015, France. Fax: (33-1) 45.68.55.15

International Perspectives on Technological Education: Outcomes and Futures, Proceedings of the International Working Seminar of Scholars for Technology Education, Washington DC, USA, 24-27 Sept. 1998 (v. Connect, vol. xxiv, No. 1/2, 1999), Ed.s Walter E. Theuerkauf, Michael J. Dyrenfurth (1999, 392 p.), has been published and is available from: WOCATE, Schlosserstr. 9, 99084 Erfurt, Germany. Fax:49-361-562.1507 E-mail: wocate@thueringen.de

Evaluating Environmental Education (1999, 144 p., US$ 20) by H. Stokking, L. Van Aert, W. Meijberg and A. Kaskens, is a publication of the IUCN Commission on Education and Communication (CEC). It explains the purpose of evaluation, outlines the steps behind the evaluation process and demonstrates how evaluation can be introduced as regular activity in an organisation. Also deals with the theory and practice of carrying out large scale and comprehensive evaluation of education programmes. Order from: IUCN Publications Unit, 219c Huntingdon Road, Cambridge CB3 0DL, U.K. Tel: +44-1223-277894 Fax +44-1223-277175 E-mail: info@books.iucn.org

Une éducation à l’environnement pour le XXIe siècle : Elements de débat et perspectives en vue d’un forum permanent (EE for the 21st Century: Elements and perspectives for continuing discussion), Ed. Yolanda Ziaka, 2000, 216 p., is a compilation of the work accomplished by the International Network in EE “Polis” from 1994 to 1999. Divided into 7 thematic chapters going from the concept of EE to its aims, targets, networks, activities, didactic methods and materials with annexes for further information. French only. For further information contact: Editions Charles Leopold Mayer, 38, rue Saint Sabin, 75011 Paris, France. Tel/Fax: (33-1)48.06.48.86

The 4th Report on the World Nutrition Situation, January 2000: Nutrition throughout the Life Cycle (2000, 121p.), has been published by the UN Administrative Committee on Coordination, Sub-Committee on Nutrition (ACC/SCN) in collaboration with the International Food Policy Research Institute (v. Connect, Vol. XXIV, No. 3, 1999). Contains chapters notably on: Micronutrient update; Breastfeeding and complementary feeding; Nutrition and human development and Nutrition of refugees and displaced populations. Order from: ACC/SCN Secretariat, c/o World Health Organization, 20 avenue Appia, CH-1211 Geneva 27, Switzerland. Fax: 41-22-798.88.91 E-mail: accscn@who.ch

Hazardous Chemicals in Human and Environmental Health: a resource book for school, college and university students (2000, 110 p.) is a World Health Organization publication. Produced by the International Programme on Chemical Safety for youth who will work in industry, agriculture, government and other public/private sectors, for them to be fully informed and take appropriate decisions at local, national and international levels for environmentally sound management. Order from: International Programme on Chemical Safety, World Health Organization, 1211 Geneva 27, Switzerland. Fax: 41-22-791.48.48 E-mail: ipcsmail@who.ch
**Learning and Teaching Mathematics:** An International Perspective, T. Nunes & P. Bryant, Eds (1999, 464 p., £19.95) is a collection of articles by a variety of experts on mathematics education all holding the view that mathematics is a form of intelligent problem solving which plays an important part in children's lives outside the classroom as well as in it. The book gives an exciting account of recent and radically different research on teaching/learning mathematics bound to have a far reaching effect on views about mathematics education. Order from: Psychology Press, International Thomson Publishing Services, Cheriton House, North Way, Andover, Hampshire, SP10 5BE, UK. Fax: +44-1264-343005 E-mail: book.orders@tandf.co.uk

**Algae** is a new sourcebook for teachers in the Changes in the Environment Series produced by the SCI-LINK project of the North Carolina State University. It is a result of a cooperative venture between scientists and teachers and includes a conceptual outline, frequently asked questions with answers, inquiry-based activities, Internet suggestions, glossary and references. Price US$25. Further information from: Kendal/Hunt Publishing Company, 4050 Westmark Drive, PO Box 1840, Dubuque, Iowa 52004-1840, USA.

**Zero Population Growth (ZPG)** have announced the release of the new, millennium version of its classic educational video World Population using new animation, illustrations, soundtrack and the latest data. It also includes a 12-page discussion and activity guide exploring population related issues such as carrying capacity and natural resource consumption. Price US$ 19.95 (+ s&h). Order from: Zero Population Growth, 1400 16th Str. NW, Suite 320, Washington DC 20036, USA. Tel: 1-800-767-1956 http://www.zpg.org/education

In the series “Un point sur...” INRA publications have announced two volumes entitled L’EAU (Water). The first volume, subtitled Milieu naturel et maîtrise (Natural environment and management) (1999, 204p., 175FF) deals with its history, the water cycle, aquatic environment, fish as well as its relationship with the soil and the biosphere, plants, irrigation and drainage. The second volume, Usages et polluants (Uses and pollutants) (1999, 208 p., 175FF) focuses particularly on management and law, nutritional aspects, problems of pollution, treatment and purification. Addressed specifically to teachers, water and environmental specialists, as well as journalists, public representatives, agriculturists etc. Price for the two: 300FF.

**French only.** Order from: Librairie ECOSPHERE, 11 rue Albert Einstein, BP 8, 77421 Champs-sur-Marne, Mame La Vallée Cedex 2, France. Tel: (33-1) 64.73.93.53 Fax: (33-1) 64.73.95.35. The Sustainable Development Education Panel of UK has published its Second Annual Report 1999 (99EP0990/01) together with 7 informative leaflets entitled “What Sustainable Development Education Means” addressed respectively to: For us All (99EP0990/02); Workplace (99EP0990/03); Schools (99EP0990/04); Libraries and museums (99EP0990/05); Youth services and youth workers (99EP0990/06); Further and higher education (99EP0990/07) and Professions (99EP0990/08). Available online at: <http://www.environment.detr.gov.uk/sustainable/educpanel/index.htm> or on writing - with code number - to: DETR Free literature, PO Box 236, Wetherby, West Yorkshire LS23 7NB, UK. Fax:+44-0870-1226-237


The thematic focus of the May/June 2000 issue of TechKnowLogia is “Technologies for Basic Education for All”. Available online at: <http://www.TechKnowLogia.org>

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**Four mini-guides on Environmental Protection Initiatives in Europe**

Eight environmental magazines from Austria (Umweltschutz), Belgium (Ecomanager), France (Environnement Magazine), Germany (UmweltMagazin), Italy (Inquinamento), Netherlands (MilieuMagazine), Spain (Tecno Ambiente) and UK (Environment Business Magazine), have designed and published within the European Environmental Press association (EEP), four mini-guides on environmental protection initiatives in Europe. Entitled Four guides to share our experiences they focus on: Water, Waste, Employment and Air.

Each guide is divided into two parts: the European perspective, comprising a third of the contents; and case studies from European countries.

This unique collaborative project has received funding from the European Commission (Direction General Environment) and has been published in six European languages: Dutch, English, French, German, Italian, and Spanish.

For copies contact: Sophie Short, EEP Coordinateur, European Environmental Press 38, rue Croix-des-Petits-Champs, 75001 Paris, France. Fax: +33.1.53.45.89.11 E-mail: eep@imaginet.fr http://www.eepweb.org
ORGAN DONATION AND TRANSPLANTATION EDUCATION

Organ and tissue transplantation is one of the more relevant scientific advances of this century. Today, organ transplantation can offer a complete cure for an indeterminate period of time and even for life. Worldwide, every 18 minutes a patient is put on the waiting list to receive a new organ or tissue. However, 30% patients die yearly due to the severe lack of donors and it is estimated that 8-10 persons who could recover a normal life, die every day because of shortage of organs.

A gift of life through organ donation is not only the rational expression of a community facing the progress of science, it also confirms an awareness of what medicine can offer today. Unfortunately, the opposite is often the case. However, education has the possibility of achieving remarkable advances in medical sciences and also of offering millions of people the opportunity for a second chance in life through well-designed programmes and campaigns.

This is why UNESCO is considering the possibility of developing such programmes. For this, your experiences and suggestions are crucial. If you have worked in this field or have an opinion on why it is - or is not - important, please let us know us at the address below.

Viewpoint

If you have something concerning STEE to communicate to us - information, suggestions, opinions, ideas - on events or even the articles in Connect, write to us - briefly. The most interesting letter(s) will be published, in substance, with the sender’s name. Send your letters to Viewpoint, address below.

CONNECT is also available on the Science & Technology Education homepage:
http://www.unesco.org/education/educprog/ste/index.html

Due to staff shortage, it is no longer possible to attend to requests for mailing list changes without the SUBSCRIPTION NUMBER (top right hand corner of address label).

Unless otherwise stated, all correspondence concerning Connect should be addressed to:
Editor, Connect, UNESCO/ED/SVE/STE, 7 Place de Fontenoy, 75352 Paris Cedex 07, France. Fax: (33-1) 45.68.56.26
E-mail: d.bhagwut@unesco.org
N.B. Replies to unsolicited correspondence cannot be ensured