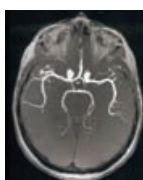
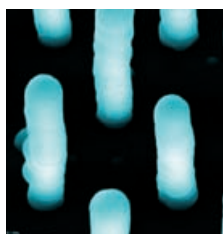
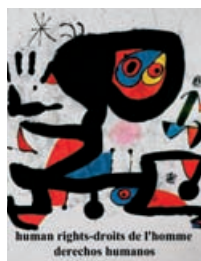


Ethics of

Science and Technology

at UNESCO



Division of Ethics of Science and Technology
Sector for Social and Human Sciences
United Nations Educational, Scientific and
Cultural Organization (UNESCO)

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Ethics of science & technology at UNESCO

WHEN AND WHAT?

UNESCO's involvement in promoting international reflections on the ethics of the life sciences commenced in the 1970s, culminating in the creation of the Organization's Programme on Ethics of Science and Technology in the 1990s (starting with its work on Bioethics in 1993). The Programme addresses two major concerns:

- that the rapid pace of scientific development is not necessarily matched by the various dialogues within wider society on the impacts of such development; and
- that unbridled scientific progress is not always ethically acceptable.

WHY UNESCO?

In the era of globalization, the development and diffusion of science and technology are increasingly global in nature. As a result, there is also an urgent need to establish and promote common norms and values, promote ethical principles and standards to guide scientific progress and technological development, and safeguard equal access to the benefits of scientific and technological advances.

UNESCO, being the primary UN agency with a specialized mandate in the social and human sciences, is strategically and appropriately positioned to promote a global ethics framework for science and technology. By locating the Programme within the Sector for Social and Human Sciences, UNESCO acknowledges that ethics need:

- to be rooted in philosophical reflection;
- to be based on the framework of human rights; and
- to operate within the sciences while maintaining an independent and critical distance from them.

These fundamentals provide a solid foundation for the Programme to effectively cooperate with the sciences, to introduce ethics in education and to strengthen the ethical link between scientific advancement and the cultural, legal, philosophical and religious contexts in which it occurs.

WHO AND HOW?

The Division of Ethics of Science and Technology is responsible for the development and implementation of activities outlined in the Programme. Through these activities, UNESCO builds and reinforces linkages among ethicists, scientists, policy-makers and the general public to assist Member States in enacting sound and reasoned policies on ethical issues in science and technology.

The Division's two main areas of activities are **Bioethics** and **Science and Technology**. These activities are supported and strengthened by the following major projects:

- Assisting Bioethics Committees (ABC)
- Ethics Education Programme (EEP)
- Global Ethics Observatory (GEObs)
- Ethics around the World



FOR MORE
INFORMATION

Division website:
[www.unesco.org/
shs/ethics](http://www.unesco.org/shs/ethics)

Bioethics

UNESCO has been involved in bioethics since the 1970s, and formally established its programme in this field in 1993. The programme provides an intellectual forum for multidisciplinary, pluralistic and multicultural reflection on bioethics through its various statutory bodies and by organizing and participating in bioethics activities all over the world. The Organization intends to foster both national and international debate on the major ethical issues arising from recent developments in the life sciences and their applications in order to work out a common ethical standard-setting framework for the international community and Member States.

STATUTORY BODIES

UNESCO has two statutory bodies in bioethics for which the Division serves as the Secretariat: the International Bioethics Committee (IBC) and the Intergovernmental Bioethics Committee (IGBC).



■ International Bioethics Committee (IBC)

The IBC was created in 1993. It is a body of 36 independent experts appointed by the Director-General of UNESCO and follows progress in the life sciences and its applications in order to ensure respect for human dignity and freedom. The IBC represents the only global forum for in-depth reflection in bioethics. The IBC's tasks include:

- 1/ To promote reflection on the ethical and legal issues raised by research in the life sciences and their applications;
- 2/ To encourage the exchange of ideas and information, especially through education;
- 3/ To encourage action to heighten awareness among the general public, specialized groups and public and private decision-makers involved in bioethics;

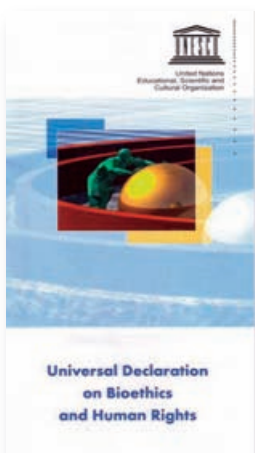
- 4/ To cooperate with the international governmental and non-governmental organizations concerned by the issues raised in the field of bioethics as well as with the national and regional bioethics committees and similar bodies; and
- 5/ To contribute to the dissemination of the principles set out in the UNESCO Declarations in bioethics, and to the further examination of issues raised by their applications and by the evolution of the technologies in question.

■ Intergovernmental Bioethics Committee (IGBC)

The IGBC was created in 1998. It is comprised of 36 Member States, elected by the General Conference of UNESCO, whose representatives meet at least once every two years to examine the advice and recommendations of the IBC. It informs the IBC of its opinions and submits these opinions along with proposals for follow-up of the IBC's work to the Director-General of UNESCO for transmission to Member States, the Executive Board and the General Conference.

STANDARD-SETTING ACTIVITIES

The necessity of setting universal ethical guidelines covering all issues raised in the field of bioethics and the need to promote the emergence of shared values have increasingly been a feature of the international debate. The need for standard-setting action in the field of bioethics is felt throughout the world, often expressed by scientists and practitioners themselves and by lawmakers and citizens.



Over the years, UNESCO has confirmed its standard-setting role in bioethics with the successful adoption of the following international instruments in bioethics:

- *Universal Declaration on the Human Genome and Human Rights* (1997, endorsed by the UN General Assembly in 1998)
- *International Declaration on Human Genetic Data* (2003)
- *Universal Declaration on Bioethics and Human Rights* (2005)

AWARENESS RAISING & CAPACITY BUILDING

UNESCO endeavors to identify ethical issues for specific regions in an effort to define and implement appropriate strategies for the promotion and development of ethical reflection in these areas. It is also involved in education and awareness raising of bioethics among specialists (researchers, lawyers, journalists, etc.), decision-makers, the general public and specific target groups.

UNESCO acts as an adviser to Member States wishing to promote reflection and debate on bioethics, to set up national ethics committees and to define national standards and/or legislation in the field. It contributes to national and regional capacity building by facilitating the establishment of networks of institutions and specialists concerned with bioethics, and encourages the establishment or strengthening of regional bioethics information and documentation centers. At the university level, the UNESCO Chairs in Bioethics facilitate regional cooperation between universities and UNESCO in bioethics education.

INTERNATIONAL COOPERATION & COORDINATION

With its standard-setting work and unique multicultural and multidisciplinary intellectual forums, UNESCO has been recognized as the lead agency in bioethics within the UN system. For this reason, UNESCO serves as the Permanent Secretariat of the Inter-Agency Committee on Bioethics, established in 2004 at the initiative of the Director-General of UNESCO. The Committee is composed of UN agencies concerned with bioethics (members, such as WHO and FAO) as well as international intergovernmental organizations and institutions with activities in bioethics (associate members, such as African Union and Council of Europe). The Committee provides a forum for debate and exchange of information in the field of bioethics and related issues, with special attention to human rights. It examines topical subjects and issues in order to identify cases where concerted or joint efforts would be beneficial and where major gaps and constraints affecting cooperation need to be addressed.

FOR MORE
INFORMATION

Bioethics website:
[www.unesco.org/
shs/bioethics](http://www.unesco.org/shs/bioethics)

Science & Technology

UNESCO's programme in ethics of science and technology, which was created in 1998, aims to promote consideration of science and technology in an ethical framework by identifying emerging challenges and encouraging awareness of their ethical implications, developing and refining conceptual frameworks in conjunction with a broad range of stakeholders, and assessing the value of new ethical mechanisms.

The programme focuses in particular on:

- **Science ethics**, articulating the basic values and ground rules of scientific research and its applications, especially in light of the growing risk of conflicts of interest (e.g., due to pressure to publish, commercialization or security constraints), and assessing the institutional mechanisms that define academic freedom and responsibility.
- **Environmental ethics**, which seeks to identify, clarify and emphasize the moral values that need to be promoted in relationships with the environment, in light of challenges such as climate change and growing pressure on scarce resources and vulnerable socio-ecosystems.
- **The ethical issues related to emerging challenges and technologies** such as space technology, nanotechnology and growing technological capacity to monitor and control persons and information flows, with particular reference to the needs of developing countries, which require access to creative and innovative low-tech, low-cost technologies focused on social needs.



STATUTORY BODY

The Division serves as the Secretariat for the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), an advisory body and forum of reflection created in 1998 and composed of 18 independent experts. COMEST is mandated to formulate ethical principles that could provide decision-makers with criteria that go beyond economics. It delivers recommendations to the Director-General on issues tabled for its consideration by UNESCO. The tasks of COMEST include:

- 1/ To advise UNESCO on its programme concerning the ethics of scientific knowledge and technology;
- 2/ To be an intellectual forum for the exchange of ideas and experience;
- 3/ To detect on that basis the early signs of risk situations;
- 4/ To perform the role of adviser to decision-makers in this respect; and
- 5/ To promote dialogue between scientific communities, decision-makers and the public at large.

The work of the Commission is designed:

- To bring the global debate to the regional level, creating better connections with the scientific community and focusing on the issues that are pertinent to specific regions;
- To deliver particular and timely products to the Member States, especially through standard-setting activities; and
- To apply such standards in the scientific and policy communities, creating awareness of ethical issues and building capacities to deal with them appropriately. Special emphasis is placed on the importance of teaching of ethics in scientific education.

LABORATORY OF IDEAS

UNESCO brings together ad hoc groups of leading experts to make ‘state-of-the-art’ studies and recommendations for action in areas of applied ethics. Current thematic areas include science ethics, environmental ethics and ethical issues related to emerging challenges and technologies. However, UNESCO has also been involved in other thematic areas such as the ethical practice of water use, space ethics and the precautionary principle.

Recognizing that awareness raising is fundamental to the promotion of ethics in science and technology, UNESCO’s target audience is composed not only of ethicists, the scientific community and policy makers but also the general public and, in particular, the youth. This is strongly reflected in the composition of participants in COMEST’s ordinary sessions held around the world. UNESCO’s capacity building efforts in the area of ethics of science and technology take the form of education, network building, resource provision and technical advice.



FOR MORE
INFORMATION

Science and
Technology website:

[www.unesco.org/
shs/est](http://www.unesco.org/shs/est)

Assisting Bioethics Committees (ABC)

The ABC initiative is designed to reinforce the bioethics infrastructure in Member States through the establishment of National Bioethics Committees, and by enhancing functioning of such committees. It is an essential component of UNESCO's capacity building effort in the area of bioethics. The rationale for this initiative stems from the *Universal Declaration on Bioethics and Human Rights* (2005), which advocates for the establishment of independent, multidisciplinary and pluralist ethics committees at national, regional, local and/or institutional levels. Bioethics committees serve as effective platforms from which to implement UNESCO's Declarations in bioethics; to provide guidance and advice to policy-makers and governments; and to promote ethical debate, analyses and policy development.

Under the ABC strategy, capacity building efforts are deployed in these three steps:

FACT-FINDING

This step involves identifying and collecting accurate data about existing ethics committees, ethics expertise, ethics education at university level, ethics advisory bodies at different levels, ethics related legislation and guidelines, codes of conduct and ethics review mechanisms within a country. This information forms the basis of a 'diagnosis' of the existing ethics infrastructure, and is stored in the Global Ethics Observatory (see section on GEObs).

PROVISION OF PRACTICAL INFORMATION

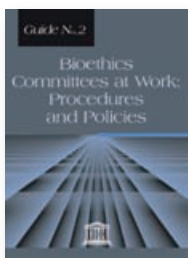
UNESCO provides practical information about National Bioethics Committees with a series of Guidebooks, which include:

- *Guide No. 1 – Establishing Bioethics Committees*
- *Guide No. 2 – Bioethics Committees at Work: Procedures and Policies*
- *Guide No. 3 – Educating Bioethics Committees*



These Guidebooks provide information on the various steps to be taken when creating a National Bioethics Committee; on recommended working methods and procedures to ensure effective and efficient functioning of such committees; and on suggested training and education for committee members. UNESCO does not advocate a particular model for National Bioethics Committees, and it is up to each Member State to decide on the various modalities of such a committee.

TECHNICAL SUPPORT



Through the Division, UNESCO has set up two task forces of experts with practical experience in national ethics committees to provide technical support in the establishment of National Bioethics Committees. One task force is English-speaking and the other is French-speaking. Technical support is offered in the following three phases:

- Provide practical recommendations in order to establish National Bioethics Committees;
- Support National Bioethics Committees, once established, in developing appropriate working methods and operational procedures; and
- Improve the functioning of National Bioethics Committees, once operational, through evaluation and training.



FOR MORE INFORMATION

Assisting Bioethics Committees (ABC) website:
www.unesco.org/shs/ethics/abc

Ethics Education Programme (EEP)

The importance and need for ethics education in the sciences were highlighted and emphasized by UNESCO's *Universal Declaration on the Human Genome and Human Rights* (1997) and *Universal Declaration on Bioethics and Human Rights* (2005), as well as the *World Conference on Science's Declaration on Science and the Use of Scientific Knowledge* (1999). COMEST, in its report on *The Teaching of Ethics* (2003), encouraged universities and other institutions of higher learning to establish ethics teaching courses at the elementary, advanced and Ph.D. levels. The Commission further recommended that UNESCO develops courses in ethics, supports ethics teaching in developing countries and establishes UNESCO Chairs to promote the teaching of ethics. During the 32nd UNESCO General Conference in 2003, Member States expressed the need to initiate and support teaching programmes in ethics, not only in bioethics but also in all scientific and professional education. On the basis of these recommendations and statements, UNESCO initiated the Ethics Education Programme in 2004. The overall objective of UNESCO activities in this programme is to reinforce and increase the capacities of Member States in the area of ethics education.

The activities in the programme are interconnected and are as follows:

MAPPING OF EXPERTS IN ETHICS TEACHING

This activity collects information on ethics experts and ethics teaching experts around the world to identify the avenues for collaboration and exchange, as well as the gaps where ethics teaching should be promoted and strengthened. The data concerning these experts are then introduced in the Global Ethics Observatory (see section on GEObs).

SAMPLING OF ETHICS TEACHING PROGRAMMES



In order to facilitate the development of programmes, the comparison of programmes, and the possible certification of programmes, it is necessary to collect information on existing teaching programmes in ethics. In this way, experiences can be sampled, compared and exchanged. This activity collects samples of programmes not only in bioethics (as taught in medical schools or nursing schools) but also in other areas of ethics, such as environmental ethics and science ethics (as taught in science schools and humanities departments).

Five forms have been developed in order to obtain standardized and comparable data concerning teaching activities, covering graduation programmes, master programmes, continuous education programmes, specialization programmes and doctorate programmes. The forms have been and will be distributed among experts identified in various groups of Member States with the invitation to provide a detailed description of their programmes. These experts are then invited to take part in regional meetings to discuss and edit their submissions. Once the programme descriptions have been validated, it will be entered into the Global Ethics Observatory (see section on GEObs).

DEVELOPMENT OF A BIOETHICS CORE CURRICULUM

Since the quality of existing ethics teaching programmes is extremely heterogeneous, in order to effectively promote ethics education in diverse contexts, it is necessary to set standards and criteria for ethics curricula. An Advisory Expert Committee for the Teaching of Ethics has been established to assist the Division in executing this aspect of the programme. This *ad-hoc* Committee is composed of experts from the IBC, COMEST, the World Medical Association (WMA), the Academy of Sciences for the Developing World (TWAS) and a representative of the UNESCO Chairs. The first task of the Committee is the development of a proposal for a bioethics core curriculum, based on the *Universal Declaration on Bioethics and Human Rights* (2005). The

bioethics core curriculum is created specifically to assist teachers who are planning to introduce ethics or explore new methods of teaching ethics in their medical programme, and if proven successful, could be adapted for other academic disciplines.

ETHICS TEACHER TRAINING

One common finding from the mapping exercise for ethics teaching programmes is the vulnerability of such programmes. There is often no firm institutional basis or systematic effort to create a future generation of ethics teachers beyond existing teachers. Without the support of enthusiastic teachers, there is a real probability that the programmes will disappear from the curricula. In order to make the programmes more sustainable, it is necessary to corroborate the efforts undertaken. The Ethics Teacher Training Course, in cooperation with the UNESCO Chair in Bioethics in Haifa, Israel, was launched to address this issue by training a new generation of teachers in ethics. The objectives of the Ethics Teacher Training Course are:

- To introduce the students to the means and resources of teaching ethics;
- To teach the students the methodologies and methods of teaching ethics; and
- To assess and provide feedback on the students' demonstrations of teaching skills under the guidance of experienced teachers.



EDUCATIONAL RESOURCES

In order to support ethics teaching programmes, adequate resources need to be available for students as well as teachers. UNESCO, with its experiences in education, is in a strategic position to address this need. Learning materials can be provided for free, for example through the distribution of materials or through the dissemination of literature via the Internet. There is also a need to develop new educational materials that pay specific attention to the various cultural and ethical situations in different parts of the world. Under this activity, UNESCO supports the development of such educational resources through a variety of its publications, including those by the IBC and COMEST, as well as in cooperation with UNESCO Chairs.

UNESCO CHAIRS

UNESCO Chairs assist the Organization in the implementation of the Ethics Education Programme. Activities with Chairs are often designed to reinforce existing teaching/research programmes in the field of bioethics or ethics of science and technology. UNESCO Chairs in Bioethics are located in Barcelona (Spain), Brasilia (Brazil), Buenos Aires (Argentina), Egerton (Kenya), Haifa (Israel), Lima (Peru) and Washington D.C. (USA).

ESTABLISHMENT OF REGIONAL INFORMATION AND DOCUMENTATION CENTERS

When activities in a particular region have started, an important resource for future activities will be the availability of adequate information and documentation regarding materials from the region itself, and in the official working language used in that region. Regional Information and Documentation Centers are established for this purpose, and for supporting the provision of educational resources to students and teachers in the region.

INTERNATIONAL NETWORKING AND TECHNICAL ASSISTANCE

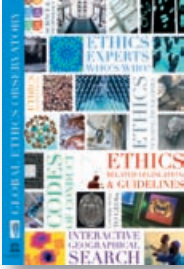
UNESCO collaborates with various regional and international networks to promote ethics education around the world. The Division also provides technical assistance in the development of ethics teaching programmes at the request of Member States or universities, organizations and institutions.



FOR MORE
INFORMATION

Ethics Education
Programme
(EEP) website:
[www.unesco.org/
shs/ethics/eep](http://www.unesco.org/shs/ethics/eep)

Global Ethics Observatory (GEObs)



The GEObs is a system of databases with worldwide coverage in bioethics and other areas of applied ethics in science and technology such as environmental ethics, science ethics, and technology ethics. This initiative is freely accessible online to all Member States and the general public, and is available in the six official languages of UNESCO (i.e. Arabic, Chinese, English, French, Russian and Spanish). It is designed to serve as a valuable consultative and comparative resource hub of ethics activities around the world to encourage collaboration. The GEObs is also intended to become a crucial platform for supporting and advancing ethics activities by assisting Member States and other interested parties to identify experts, establish ethics committees, construct informed policies in the area of ethics and design ethics teaching curricula. It is also designed to support and enrich all activities within the Division.

The observatory consists of the following databases:

DATABASE 1: WHO'S WHO IN ETHICS

This database is a compilation of information regarding ethics experts around the world. Experts are determined via a peer review process based on recent publications related to ethics of science and technology; recent research projects related to ethics of science and technology; level of ethics component in the individual's educational background; and extent of ethics involvement in the individual's professional background and activities.

DATABASE 2: ETHICS INSTITUTIONS

This database provides information on departments, institutes, centers, commissions, councils, committees, review boards, societies, associations and other relevant entities in the area of ethics of science and technology. Institutions within the database have been validated against their mission, activities and publications as a confirmation of their active involvement in the field of ethics of science and technology.

DATABASE 3: ETHICS TEACHING PROGRAMMES

This database contains descriptions of teaching programmes within the fields of bioethics and ethics of science and technology collected through the Ethics Education Programme (see section on EEP).

DATABASE 4: ETHICS RELATED LEGISLATION AND GUIDELINES

This database is a collection of examples and descriptions of ethics related legislation and guidelines introduced within various countries and institutions worldwide to regulate activities in the fields of science and technology. Information for this database is collected and analyzed by legal experts identified from various Member States, and subsequently reviewed and validated by the Review Committee consisting of legal experts from various regions and legal traditions. Experts are required to collect and analyze legal instruments for provisions that are relevant to specific bioethical themes and articles of the *Universal Declaration on Bioethics and Human Rights* (2005) and the *International Declaration on Human Genetic Data* (2003). Once validated, these provisions are then entered into the database with cross-referencing to the relevant bioethical themes and articles from the two declarations.

DATABASE 5: CODES OF CONDUCT

This database provides a selection of Codes of Conduct related to the ethics of science and technology issued by professional entities in the private and public sectors. Provisions within these codes are examined to identify common principles, according to the criteria set out in an interim analysis of codes of conduct and codes of ethics. Once validated, these provisions are entered into the database with cross-referencing to the identified principles.

The GEObs databases are continuously being expanded to capture a more comprehensive picture of the ethics infrastructure in each Member State.

FOR MORE
INFORMATION

GEOb website:
[www.unesco.org/
shs/ethics/geobs](http://www.unesco.org/shs/ethics/geobs)

Email:
geobs@unesco.org

Ethics around the world

UNESCO is organizing a series of ethics conferences in various countries for the purposes of:

- Providing information about the activities of UNESCO in the area of ethics, and disseminating materials produced; and
- Interacting with professionals and experts from the country to exchange information, solicit input for UNESCO activities and create a network of interested parties.

The series of conferences is planned in cooperation with the National Commissions for UNESCO. Generally, the conference is organized on a one-day basis. The basic idea is that every conference has a similar format with the same programme during the morning session and a variable programme during the afternoon session, and possibly the following morning session. The variable programme is adapted to local needs and requirements. It is to be discussed with the interested parties how the programme can be made as attractive as possible within the country, involving experts, professionals, policy-makers and other relevant groups.

Within the context of approved activities in UNESCO's Programme on Ethics of Science and Technology, several options for the conference's programme can be offered:

- The conference can be an opportunity to discuss ways and means of implementing the international instruments and their incorporation into practices and national legislation.
- The focus can be on introducing, expanding and improving ethics teaching programmes (see section on EEP).
- Discussion can elaborate the ways and means of establishing National Bioethics Committees or reinforcing the activities of existing committees (see section on ABC).

- The rotating conference can also be a means of promoting public debate on ethical issues, involving various stakeholders, organizations and groups of individuals in the debate.

When the conference has been concluded, a draft report will be made. After approval this report will be accessible on the Division's website.

Member States are invited to participate in this programme of rotating conferences (please see website for participation details).



FOR MORE
INFORMATION

Division website:
[www.unesco.org/
shs/ethics](http://www.unesco.org/shs/ethics)

Important recent publications

Best Ethical Practice in Water Use
(COMEST)

Environmental Ethics and International Policy

Ethics of Science and Technology: Explorations of the frontiers of science and ethics

*Guide No. 1:
Establishing Bioethics Committees*

*Guide No. 2: Bioethics Committees at Work:
Procedures and Policies*

*Guide No. 3:
Educating Bioethics Committees*

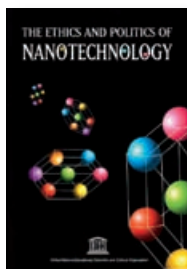
Human Cloning – Ethical Issues

Nanotechnologies, Ethics and Politics

The Ethics and Politics of Nanotechnology

The Precautionary Principle (COMEST)

The Teaching of Ethics (COMEST)



FOR MORE
INFORMATION
ABOUT THESE
AND OTHER
PUBLICATIONS

Division website:
[www.unesco.org/
shs/ethics](http://www.unesco.org/shs/ethics)

Internet links

Division of Ethics of Science and Technology

www.unesco.org/shs/ethics

Bioethics

www.unesco.org/shs/bioethics

Science and Technology (ST)

www.unesco.org/shs/est

Assisting Bioethics Committees (ABC)

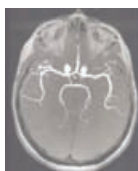
www.unesco.org/shs/ethics/abc

Ethics Education Programme (EEP)

www.unesco.org/shs/ethics/eep

Global Ethics Observatory (GEObs)

www.unesco.org/shs/ethics/geobs



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