



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS BIOSEM

Bioethics and sustainable environment management
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INTRODUCTION

The developers of the BIOSEM project faced a unique challenge. We intended to develop a programme to teach Bioethics in high schools, which means for students between 15 and 18 years of age. We are aware that while bioethics is not a regular school subject, we consider the content relevant to life today and especially to life in the future. We have developed competency frameworks for different bioethical topics. They can be used as a basis for an elective subject in schools or as part of regular school subjects (e.g., biology, chemistry, languages, civics, religion, etc.).

Bioethics builds a bridge between science and values. It places at the centre of its focus the relationship between individuals and the relationship of individuals to the environment in which they live. The unit of analysis of bioethics is life, regardless of whether the life of humans or other forms of life on the planet is placed in the focus. More specifically, the focus of interest of bioethics is the life of the planet and, above all, the attitude of people towards it. Bioethics sees the relationship of people to the life of the planet through the prism of ethical standards and principles. In that sense, bioethics gives an ethical judgment about whether the attitude of people towards life on the planet contributes to its sustainability in the long run or not. It seems that the attitudes of people towards life and the moral dilemmas related to that question are more relevant today than at any other time in history. This explains the relevance and growth of bioethics as a discipline.

A significant part of the specific problems in human moral decision-making and behaviour are related to questions about life. Questions about life, personality, personal identity, death and mortality, health, medicine, biotechnology, hyper-reality, trans-humanity, bio-diversity, bio-regionalism, animal rights and similar are bioethical questions. In this sense, bioethics can be considered as a kind of applied ethics. This does not mean that the whole of applied ethics is bioethics, nor does it mean that bioethics is only applied ethics because, within its framework, normative and meta-ethical areas also exist. However, our interest is primarily focused on the practical contribution that bioethics makes in the opening and resolution of ethical dilemmas related to life in modern society.

Sometimes, it may seem that individual actions do not have a meaningful impact and that the various political and economic currents are too strong for individuals to change anything. Therefore, it is important that, from the earliest years of a child's life, we in education work to ensure that pupils recognise the importance of acting responsibly towards themselves, other people, other living beings, and the natural environment as a whole. In addition to concrete knowledge in specific areas, they also need an awareness of the fundamental ethical values that ensure that knowledge is used for the benefit of people, other living beings, and the ecosystem as a whole. Working with young people would contribute to increasing their awareness of the



importance of applying bioethical standards in everyday life and would make young people think critically about the attitude they show towards the environment they live in, which ultimately comes down to the personal responsibility of individuals. Working with young people would also help them to increase their level of knowledge and skills, which would help them to orient themselves more easily and react in given situations in which it is necessary to make decisions and act based on ethical principles.

We understand **bioethics** as an interdisciplinary approach to evaluate human intervention in life in all forms: in human life, in animal life and the life of the whole natural environment. Considering the scope of bioethics, we made a selection of topics that we will cover based on the goals of the project 'Bioethics and Sustainable Environmental Management in Schools' and the fact that it is intended for high school students. Therefore, during the selection of the topics, we were guided by two criteria: 1) the topics to be relevant within the framework of bioethics, and 2) the topics to be suitable for the age group to which the project is ultimately intended.

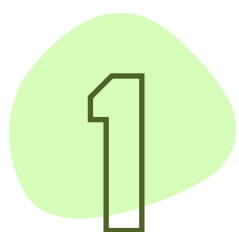
Our 7 topics are:

- 1- **Global justice**
- 2- **Climate change**
- 3- **Human development**
- 4- **Ecosystem health and water resources**
- 5- **Science and technology**
- 6- **Animal living**
- 7- **Minimalist living.**

For each of these areas, we have indicated which knowledge, skills and attitudes students should acquire during these lessons. The competency framework is the basis for the development of further materials in our project.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS



GLOBAL JUSTICE



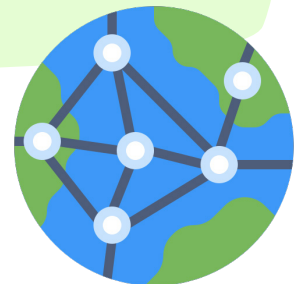
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Globalisation is a significant phenomenon that has changed much of human civilisation in recent decades. With the advancement of new technologies, the way of communication between people has changed. Computers, mobile phones, and the internet, including email and social media, have facilitated interaction and caused a growing awareness of the interdependence of people worldwide. Global media, multinational corporations, and international cooperation in science and research have contributed to increasing interdependencies. In the global world, people, processes, and social structures are interconnected and interdependent, and the imbalances that may appear in one sphere of society or in one state have consequences in other social spheres or states. The lack of a market for a product, illegal migration, environmental degradation, infectious diseases, insecurity, fanaticism, and terrorism are often closely related in the modern global world.

All these issues separately have their own ethical aspects, but they can neither be understood nor adequately treated if the nature of their interrelationships is not understood and analysed or, more specifically, if they are not analysed as part of the globalisation process. It can be said that globalisation is a set of processes that have different dimensions.

Definition: Globalisation is a set of multidimensional processes that create, deepen, expand, and intensify interdependence and exchange at the world (global) level, simultaneously encouraging the awareness of the connection of global and local processes. Globalisation went hand in hand with the introduction of new technologies, such as the Internet, mobile phones, and social media, and new institutions, such as the World Trade Organization, multilateral agreements for trade in goods and services and protection of intellectual property.



Globalisation has at least five dimensions:



ECONOMIC GLOBALISATION is related to the establishment of an economic order in which the whole world is one market. Part of that process was the elimination of barriers that prevented free trade between entities on a global scale. The commercial and financial infrastructure enabled the operation of multinational companies in global frameworks. In the global economy, the most successful multinational companies have larger budgets and influence than many nation-states.



POLITICAL GLOBALISATION is related to the deterritorialisation of nation-states and politics. The increased volume of movement of people, money, and technologies across the borders of nation-states has created the impression that they are de-territorialising and losing their influence in the lives of individuals. The strengthening of supranational organisations and the regionalisation of nation-states contribute to strengthening the feeling that globalisation has led to the disempowerment of nation-states.



ENVIRONMENTALIST GLOBALISATION is associated with an increase in the risk of ecosystem damage on a global scale. Global interdependencies contribute to the fact that the threat of damage to biodiversity is not only contained within the borders of nation-states. The latest example is the constant threats to use nuclear weapons in the war in Ukraine. With the increase in interdependencies, environmental problems such as pollution, damage to biodiversity, and global warming have become global phenomena.



CULTURAL GLOBALISATION is related to the process of the expansion and intensification of cultural exchange. The products of one culture become available to members of other cultures in a very short time. This can lead to the formation of a global culture that will be richer and take many elements from many national (local) cultures, but at the same time, it may lead to the marginalisation of national and local cultures.



IDEOLOGICAL GLOBALISATION implies a series of ideas and concepts that come along with globalisation, which we take as something given in advance, which should not be questioned. Globalisation has gone hand in hand with neoliberalism and is based on the principles of market freedom and self-regulation. This resulted in policies breaking down barriers that made free trade impossible.



The global society is in need of energy, and raw materials, solutions for the issue of hunger, the fight against diseases and the protection of the health of people, animals and plants, the aspiration to constantly raise the quality of life, the search for new technologies that will make this possible, constantly opens new issues that are in the domain of bioethics. **Bioethics** considers these questions based on the principles of **concern for the common good, the public interest and the community**. Global issues are issues that cannot be resolved by the intervention of just one country. These include, for example, the issue with HIV/AIDS, but also the Covid-19 pandemic, global warming, the unequal availability of health services at the global level, and the unequal quality of health services at the global level. The wider circle of ethical issues related to globalisation includes the management of interdependencies that have increased with the spread of globalisation, the maintenance of peace and the avoidance of wars, which have unforeseeable consequences both on the territories affected by the military conflicts and on global interdependencies, the problem of the poverty that cannot be overcome in any way, the disrespect of human rights, among others.

We need to recognise that people, places, economies, and environments are interconnected and mutually dependent. We must be aware of the connections between local and global activities. Global justice is needed to prevent future conflicts among nations and damage to the natural environment. The gap between rich and poor countries is widening, raising the prospect of an unstable future.



TOPIC 1: GLOBAL JUSTICE

CROSS-CURRICULAR INTEGRATION - WHERE TO INCLUDE THE TOPIC IN REGULAR ACTIVITIES

- Geography
- History
- Languages
- Ethics
- Religious Education

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on the topic 'Global justice', students will be able:

- To understand the concepts of globalisation and global justice.
- To have knowledge of the relationship between globalisation and bioethics.
- To be aware of the interconnectedness and interdependence of all people and all living beings.
- To be aware of the advantages and disadvantages of globalisation.
- To identify bioethical elements of globalisation in their own lives.
- To identify some examples of the bioethical aspects of globalisation.
- To demonstrate knowledge about globalisation and global justice.

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on the topic 'Global justice', students will be able:

- To develop critical thinking regarding the process of globalisation.
- To make connections between the causes and consequences of globalisation related to bioethical issues
- To apply the bioethical principles in connection with the process of globalisation.
- To communicate about bioethical issues related to globalisation and global justice.
- To evaluate the actions and initiatives related to globalisation and global justice.
- To learn from failed actions in the past.
- To suggest solutions to bioethical issues raised by globalisation.



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on the topic 'Global justice', students will be able:

- To be engaged in promoting global justice.
- To value the benefits of globalisation and use its advantages.
- To cope with specific situations in which dilemmas related to globalisation arise.
- To be motivated to take initiatives for global justice.
- To value a sense of community in addressing larger global issues, such as global justice.
- To be empowered to take personal responsibility related to globalisation and global justice.
- To participate in activities that promote respect for all people and the whole natural environment.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS

2

CLIMATE CHANGE



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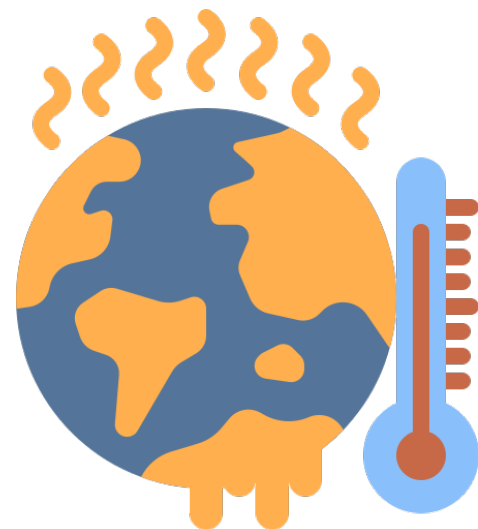
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In scientific circles, a clear consensus exists that human activities in recent decades have caused a change in the planet's climate, including global warming, rising sea levels, changing weather conditions, and similar phenomena. The increased production of carbon dioxide, methane and other greenhouse gasses in the previous century increased the temperature, as evidenced by the melting of glaciers and record heat waves. If humanity does not begin to significantly reduce greenhouse gas emissions, average global temperatures will rise by several degrees. Climate changes have dangerous consequences for the well-being, health, and lives of people but also for other types of life on the planet. The consequences are enormous if there is a temperature change of even just 2°C. They include the extinction of entire species, the reduction of plants and animals on the planet, rising sea levels threatening island nations and low-lying coastal areas, and increased frequency and intensity of extreme weather events, among others. Global warming is a global phenomenon. Greenhouse gas emissions impact the entire world.

Climate change is more of an ethical issue than a political or economic one. Everyone has an equal right to life, liberty, and security. If global warming contributes to the reduction of yields from agricultural crops if the quantity of drinking water is reduced and as a result, conflicts begin, people's rights to life, liberty, and security will be threatened. Therefore, people have an obligation to protect nature. People have that obligation to the following generations. The principle of intergenerational equality indicates that the current generation should leave a healthier environment for the next generation.

Global warming raises several ethical challenges.

First, the most developed countries have historically emitted the most greenhouse gases and owe their development, among other things, to that. In other words, while one group of countries (the most developed) are the beneficiaries of greenhouse gas, another group of countries (the poorest) suffer the consequences. Specifically, the expectations are that due to climate change, the number of people who do not have regular, permanent access to drinking water will grow in Africa, that the yield and agricultural production will decrease and that the quantity of food in that region will decrease. The ethical dilemma arises as to whether all countries should equally participate in the reduction of greenhouse gases





or whether the countries that emit the most should reduce a greater proportion than those that emit less greenhouse gas. The ethical dilemma also arises of whether more developed countries should somehow compensate developing countries for emitting more greenhouse gas, the consequences of which are also suffered by developing countries. The polluter pays principle indicates that the individual or company that has polluted the environment has an obligation to pay for its cleanup. If a company discharges toxic waste into a river and endangers the health of people living nearby, it is honourable for the owners of the company to pay the bills for cleaning up the environment but also for the health care of the individuals whose health was impaired by the pollution. This topic is covered in the film Erin Brokovich, in which Julia Roberts performs. The film tells the life story of a law clerk from California who brings charges against a large company that is polluting the drinking water of the local population.

When it comes to air pollution, the trend of accelerated growth in some of the developing countries is obvious, which increases the level of emitted greenhouse gases. It is expected that developing countries will soon emit more greenhouse gas than developed countries and that China will become the largest single emitter of greenhouse gas. While China is a ten times bigger greenhouse gas emitter than Australia, an average Chinese person emits one ninth of the greenhouse gas per year than an average Australian. While an average Chinese person is responsible for emitting 3 tons of greenhouse gas, an average Australian is responsible for emitting 27 tons of greenhouse gas, while an average Indian is responsible for emitting 1 ton of greenhouse gas per year.

The **second** ethical challenge is the intergenerational impact of greenhouse gas emissions. Indeed, once greenhouse gas is emitted, it remains in the atmosphere, contributing to a negative climate impact for hundreds and thousands of years. It seems that from the actions of one generation, the consequences are suffered by other generations on the planet. This can lead to a problem in collective action of an ethical nature.

The **third** ethical challenge is related to the relationship between humans and other species that live on Earth. The question is whether people have the moral right to take responsibility and solve issues related to the survival of other species living on the planet.

Individuals must influence politics so that measures are taken that will prevent climate change, but the responsibility of individuals is also reflected in changing consumerist practices and lifestyles. Among other things, this includes changing the way of eating by adopting a healthy diet, consuming fewer meat and dairy products, reducing the use of air transport, using electric vehicles, using public transport and other alternatives to reduce the use of vehicles that pollute the air. Structural responses to climate change include using renewable energy sources in key sectors, halting deforestation and restoring damaged ecosystems.



TOPIC 2: CLIMATE CHANGE

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Physics
- Chemistry
- Geography
- Biology
- Ethics
- Religious Education
- Languages

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on 'Climate Change', students will be able:

- To understand the basic aspects of climate change.
- To understand specific situations in which problems related to climate change arise.
- To understand the connection between bioethical principles and climate change.
- To give an example of the connection between bioethical principles and climate change.
- To know some possible actions to address climate change.
- To demonstrate knowledge of the basic aspects of climate change

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on 'Climate Change', students will be able:

- To identify specific, relevant and achievable personal goals to address climate change.
- To communicate about bioethical issues related to climate change.
- To enter into a public debate about the relationship between bioethics and climate change.
- To collaborate with others to face the issues of climate change.



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on the topic 'Climate Change', students will be able:

- To be committed to protect the environment and quality of life locally and globally.
- To develop an appreciation of the interdependence between people and the planet.
- To be willing to take personal responsibility for changing their lifestyle in order to help address climate change with their behaviour.
- To be personally motivated to participate in broader initiatives addressing climate change.
- To value joint action in addressing large global issues such as climate change.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS

3

HUMAN DEVELOPMENT

Human development at the technical level is related to the growth of capacities for improving the standard of living of people. At an essential level, the concept of human development is related to respecting the dignity of each individual. Due to its interculturality, this principle is universal and integrative and can be found in the first article of the principles of the Universal Declaration on Bioethics and Human Rights. That principle indicates the connection between human dignity and human rights and freedoms, but it also gives priority to the dignity of the individual over the interests of science and society. The word dignity derives from the Latin dignitas, meaning worthy of honour and respect. The word 'dignity' means respect for the personality of each individual and giving each individual the opportunity to strive for the fulfilment of their capacities. Respect for the person means respecting and protecting the life, health, and integrity of the body and the free expression of thought of each individual. People's innate abilities and talents differ, but each individual has the right to be treated with respect by others. In that sense, respect for the dignity of people should be distinguished from the admiration they can show to individuals who have extraordinary results in their work, whether they are athletes, artists, or scientists. Athletes with exceptionally good results can be admired, but those with less good results also deserve to be respected.

The relationship between human dignity and technology is significant. The question arises of whether the introduction of new technologies does not undermine the dignity of the individuals whom the technology is supposed to replace or whom the technology is supposed to help in raising the results of their work. Thus, the question of what happens to the dignity of workers after the discovery of new technologies that replace their work is raised, as is the question of whether the dignity of athletes is increased by the discovery of drugs that help them achieve better results. What is the difference between drugs and doping of athletes? New technologies make it possible to raise people's living standards, but they eliminate jobs for some people. Questions are asked of whether the interest of a group of people and the whole of society is more important, how to find a way for society to progress, and whether the dignity and interests of all social groups and every individual in society should be protected. Even more significant is the question of the level to which people can rely on technology.



The importance of respecting the dignity of the individual is discussed in a series of important documents, such as the Charter of the United Nations and the Universal Declaration on Human Rights.

The Universal Declaration on Human Rights (1948) talks about the inherent dignity, equality, and inalienability of human rights based on values such as freedom, justice, and peace in the world. Human Development is closely related to respect for human rights and freedoms, non-discrimination, and paying attention to vulnerable and disadvantaged groups.



TOPIC 3: HUMAN DEVELOPMENT

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Psychology
- Sociology
- Philosophy
- Ethics

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on 'Human Development', students will be able:

- To understand the concepts of human dignity, human rights, and human development.
- To know and understand the connection between ethical principles, the application of bioethics and human development.
- To know the UN's Sustainable Development Goals and understand their context.
- To demonstrate knowledge of the basic aspects of human development.

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on "Human Development", students will be able:

- To develop and be able to demonstrate critical reflection on issues regarding human rights and human development.
- To engage in discussion about the relationship between bioethics, human rights, and human development.
- To apply the bioethical principles in concrete situations concerning human rights and human development.
- To empathically engage (including active listening) with individuals in different life circumstances.



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on 'Human Development', students will be able:

- To be empowered to stand up to various dehumanising pressures in society.
- To develop autonomous personalities independent of social (media) pressures.
- To dare to express their personal beliefs in a respectful and tolerant manner
- To engage in dialogue with individuals and groups holding different stances and views.
- To join the activities promoting human rights and other issues of human development on local and global levels.
- To be empowered to take responsibility and share responsibility for human development.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS

4

ECOSYSTEM HEALTH AND WATER RESOURCES



When talking about **ecosystem health**, the first association is with human health. People go to the doctor to assess their own health. The doctor then makes a diagnosis of the health condition, assesses whether it is good or not, what causes the health problems, and which medicines should be applied to bring things back to normal, that is, to return the body to a normal state of health. Doctors use several indicators to assess the state of health: pulse, blood pressure, and sugar in the blood and in the urine. Biosystem health assessment works by the same logic. A diagnosis of the ecosystem is made to evaluate whether it is in good condition or not. If there are problems in the ecosystem, we attempt to find the reasons why they appeared. The state of the ecosystem is dynamic and can change depending on the **influence of various factors** such as fires, floods, droughts, extinction of certain species of animals, climate change, development of mining, fishing, hunting, deforestation, development of industry, especially of the chemical industry, among others. If a problem with the health of the ecosystem is diagnosed, we attempt to find a cure and measures that will bring the ecosystem back to normal. If the diagnostics show that the ecosystem is healthy, we endeavour to maintain it in such a state, which means that we must take care of the **revival of the population of indigenous species**, the **maintenance of biodiversity**, and the maintenance of evolutionary and ecological processes.

Human well-being depends on the services received from ecosystems, either directly or indirectly. People enjoy the well-being of services that they receive from completely natural ecosystems such as grasslands, forests, and oceans, but also those whose management is more present in the intervention of the human factor, such as culture and cities. Humans do not use the benefits of ecosystems equally. Some societies and social groups are able to enjoy the benefits of natural ecosystems more than others. The gap between those who already use the benefits of nature and those who do less is constantly increasing. For example, a child born in sub-Saharan Africa is 20 times more likely to die by the age of five than a child born in an industrialised country. That difference is increasing over time. People who live in a city close to a coast with a highly productive ecosystem have above-average well-being. People living in arid and mountainous areas with low-productivity ecosystems tend to have below-average and variable well-being status. The number of people in ecosystems with low productivity and low well-being is growing significantly.



People have a deep and long-term connection with water, as it is essential for human life and health. While we can survive without food for several weeks, without water, we cannot survive for more than a few days. People are dependent on water. Hence, there is a need for ethics in the use and management of water resources. Because of their dependence on water, more than 70% of people live near oceans. While people in water-rich countries take it for granted, a significant number of people in the world do not have access to water for drinking and sanitation. Water scarcity has become a key problem in recent decades. Considering the increase in the number of inhabitants of the planet, as well as the increasingly pronounced consumerism, the amount of water used by people is growing. The amount of water used by people from decade to decade on different continents has grown from 10% to 30%. The quantity of available water per capita from 1960 to 2000 decreased from 11,300 to 5,600 cubic meters of water per capita. The competition for water, for its use for the needs of households, agriculture, and industry, will become increasingly acute. For many countries, the availability of water will become a fundamental determinant of their economic growth.

The issue of distribution of scarce resources, including water, is an ethical issue. Almost million people live in areas where there is no renewable groundwater. They live by transporting water from distant locations or with water scarcity. Due to diseases related to inadequate water supply and unhygienic living conditions, 1.7 million people lose their lives annually. About 1.1 billion people do not have a quality water supply, and about 2.6 billion do not have quality sanitary conditions. Quality water supply and sanitary-hygienic conditions are related to improving people's health and economic productivity.

Many questions are asked about water. Can all people be supplied with clean drinking water? Can it be done for future generations? How to achieve equal access to drinking water? How should water be managed, and who should manage it? What will be the implication of climate change on water quality and quantity? In the 21st century, will water become what oil was in the 20th century: a source of geo-political conflict? Will water-related social change involve technological innovation or shifting cultural paradigms?



Water should be used and managed based on the following ethical principles:

» Respecting the dignity of people. This principle refers to the satisfaction of basic needs and the promotion of human health and well-being through access to drinking water.

» Equality and proportionality mean that each individual should have access to approximately the same amount of drinking water. Meeting the needs and promoting the health of all people is an important principle, but when we have limited resources, we must be guided by the principle of justice. This means that the highest priority should be given to the people who are most at risk, who have the greatest need, and who are at the greatest risk because they did not have access to clean water in the past for any reason.

» Solidarity implies awareness of interdependence, mutual support, care, and help in using water.

» The concept of the general good implies the treatment of water as a resource that is crucial for each individual in society but also for society as a whole; therefore, we should treat water based on the interests of the survival and maintenance of society as a whole and not based on the particular interests of certain individuals or social groups.

» Sobriety implies responsibility when using water. Economic and financial measures should be aimed at discouraging water abuse.

A significant trend in medicine is to analyse human health in relation to the health of the ecosystems that surround it. The approach to human health as a part of the health of the ecosystem is focused on the anticipation and prevention of diseases through a healthy diet and everyday activities to prevent the occurrence of diseases in the human body. This approach posits that health and disease are the results of complex interactions that include not only traditional aspects of health, such as physical and mental health but also include dietary habits, protection from more occupational risk factors for health, as well as the social, political, cultural, economic environments. In that sense, health can be observed as a symbiosis of biophysical and cultural factors that influence it.



TOPIC 4: ECOSYSTEM HEALTH AND WATER RESOURCES

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Biology
- Chemistry
- Geography

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on the topic 'Ecosystem Health and Water Resources', students will:

- Be able to define the concept of ecosystem health.
- Know that everything in nature is interconnected.
- Know the different factors that influence the health of an ecosystem.
- Understand the importance of water resources for the vitality of the ecosystem.
- Know the ethical principles connected with ecosystem health.
- Know the importance of water resources for human beings and the whole environment.

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on the topic 'Ecosystem Health and Water Resources', students will be able:

- To communicate about bioethical issues related to ecosystem health, especially to the protection and rational use of water resources.
- To apply bioethics principles and explore solutions regarding ecosystem health and the rational use of water resources.
- To develop a critical reflection on the concept of ecosystem health.



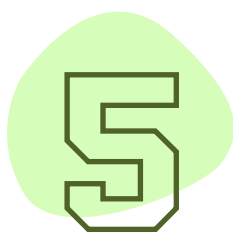
ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on the topic 'Ecosystem Health and Water Resources', students will be able:

- To commit to preserving ecosystem health and act accordingly.
- To feel empowered to deal with specific situations in which problems with ecosystem health and water resources arise.
- To engage in motivating peers to reconsider their behaviour in order to preserve ecosystem health and rational use of water.
- To join or start initiatives to establish and maintain ecosystem health and promote rational use of water.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS



SCIENCE AND TECHNOLOGY






Bioethics also investigates the ethical implications of the use of technologies in the life processes of people, other organisms, and the ecosystem as a whole.

Technology is the concept of techniques or methods to produce a product and the required knowledge of its use, application, and process for developing products (Bozeman, 2000). Technology shapes every aspect of the human experience. It is the primary driver of social and ecological change. It is a source of power, vulnerability, and inequality, influencing our perspectives and mediating our relationships.

In other words, technologies are the techniques and knowledge systems required in developing products for the good of living things. Bioethics is the ethical issue arising from human efforts to create and maintain the life and health of living things. It places particular emphasis on the question of life and, as far as the biological sciences are concerned, on preserving life. Some researchers think 'Bioethics deals with the ethical problems arising from the developments in life sciences and biotechnologies' (Onuoha, 2007). As Andoh (2011) vaguely states, bioethics involves '[...] wider cultural and social consultations that privilege all discourse about everyday life issues. It has made exponential progress in addressing moral issues in science, technology, and medicine in the world'. Also, it must be mentioned that bioethics is distinct from medical ethics, which investigates the relationship between the physician and the patient because it accentuates the relationship between science and life.

Bioethics is thus centrally about values and principles that enhance the health and quality of human life. It also seeks to prevent and cure human diseases, protect human dignity, and prevent harm to human life.

South Korea's 'Bioethics and Biosafety Act' (BBA, 2005) highlights three cardinal points regarding bioethics:

-  To enhance the health and quality of life of human beings;
-  To allow the development of life sciences and biotechnologies that can be used to prevent and cure human diseases;
-  To protect human dignity and prevent harm to human beings by ensuring life sciences and biotechnologies are developed per the principle of bioethics.

Moreover, bioethics deals with the ethical problems arising from the developments in life sciences and biotechnologies (Onuoha, 2007). Biotechnology uses biology to develop new products, methods, and organisms to improve society and human health. Biotechnology (sometimes referred to as 'biotech') has existed since the beginning of civilization with the domestication of plants and animals. The modern procedure of biotechnology is derived from various fields of science and technology, including molecular biology, chemistry, bionics, genetic engineering, genomics, nanotechnology, and informatics (Barney & Lewis, 2023).

Furthermore, the commercialisation of modern biotechnology is used in the fields of environment, medicine, industry, and agriculture. Biotechnology science is divided into colour-coded subdisciplines based on typical uses and applications.

BIOTHECNOLOGY TYPES



RED

Health, Medical, Diagnostics



YELLOW

Food Biothechnology, Nutrition Science



BLUE

Acquaculture, Marine Biotec



GREEN

Agricultural, Environmental Biotechnology
(Biofuels, Biofertilizers)



BROWN

Arid Zones and Desert Zones



DARK

Bioterrorism, Biowarfare



PURPLE

Patents, Publicationes, Inventions



WHITE

Gene-bases Bioindustries



GOLD

Bioinformatics, Nanobiotechnology



GREY

Fermentation and Bioprocess technology



Red biotechnology includes medical processes, such as the use of organisms to produce new drugs and stem cells to revive and regenerate damaged human tissues and grow and regrow entire organs.

Yellow biotechnology are processes that aid food production, the most popular application being the fermentation of alcohol and cheese.

Blue biotechnology encompasses processes in marine and aquatic environments, such as converting aquatic biomass into fuels and pharmaceuticals.

Green biotechnology covers agricultural processes, such as producing pest-resistant crops, environmentally friendly farming practices, and disease-resistant animals.

Brown biotechnology comes from green biotechnology to exploit arid and desert soils to include highly resistant plant species that increase the flora and biodiversity of these environments.

Dark biotechnology is the use of biotechnology for weapons or warfare.

Violet or purple biotechnology ensures that biotechnology practice complies with legal and ethical standards governing each field.

White biotechnology uses living cells from yeast, moulds, bacteria, plants, and enzymes to synthesise products that are easily degradable, require less energy and create less waste during their production.

Gray biotechnology are industrial processes, such as developing new chemicals or new biofuels for vehicles. It is an aspect of biotechnology that involves the application of biological systems and processes in waste treatment and management and for the protection and restoration of the quality of the environment.

Gold biotechnology, also known as bioinformatics, is a cross between biological processes and informatics. It refers to healthcare workers' methods to gather and analyse biological data to treat patients.



TOPIC 5: SCIENCE AND TECHNOLOGY

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Biology
- Technology
- Physics
- Chemistry
- Ethics
- Arts
- Sociology
- Philosophy

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on the topic 'Science and Technology', students will be able:

- To understand the importance science and technology have for society
- To know the positive and negative consequences that the development of science has on the sustainability of life on the planet
- To identify the bioethical principles connected to the scientific-technological progress
- To know that science and technology progress faster than social awareness and understand the need for ethical reflection to ensure sustainable development

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on the topic 'Science and Technology, students will be able:

- To develop critical reflection on the scientific progress from the ethical point of view
- To present and communicate effectively about bioethical aspects in the development of science and technology
- To recognise the dilemmas arising from the development of science and technology
- To apply the bioethical principles in the field of science and technology
- To debate and propose solutions to dilemmas caused by scientific and technological progress



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on the topic, 'Science and Technology', students will be able:

- To critically observe the development of science and technology and view them through a lens of ethics.
- To value the advances of science and technology and use their benefits in a responsible way.
- To support actively the initiatives for sustainable development on local and global levels.
- To preserve our common humanity in the use of technology.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS

6

ANIMAL LIVING



Animals are human companions in life. We share our habitat and food with them. We enter into diverse relationships: they help us at work, they give us food to live on, they provide us with 'emotional' closeness and they make us happy to be around them. Whenever a person forms a relationship, ethical questions arise about what is good, right, and proper within a given relationship, how one should behave to respect the other and oneself. Human relationships with animals are also subject to such ethical judgements.

Animal ethics differs from the ethics of interpersonal relationships in that there is no reciprocity of ethical responsibility, but that human beings are the sole bearers of ethical responsibility, while animals are also subject to their responsibility. Only person is a rational and free being who can take responsibility for his actions; animals are not the bearers of moral responsibility. This does not mean, however, that animals have no intrinsic value of their own, which people must respect and consider in their actions. Human beings have a special form of responsibility towards animals. Most people in our society use animal products (food, clothing, etc.), so it is very important to think about how we affect the lives of animals by the way we live and act. We must not be indifferent and insensitive to the pain and suffering of other living beings. As consumers, we share responsibility for how animals are treated.

Martin Lintner (2017) formulates the following categorical imperative that people must respect in their relationship with animals:



“Act in such a way that you will never use animals as individuals and as a community merely as a means to satisfy your own interests and needs, but at the same time in a way that is consistent with their species-specific and individual needs, emotional capacities and cognitive abilities.”

Animals have an intrinsic value that is independent of human needs and benefits and is the basis for their rights. In his conduct, people must take into account the welfare of animals. In caring for animals, they must strive to ensure that they do not suffer hunger and thirst, that they are not in fear and stress, that they are not subject to injury, that they do not suffer pain and that they are protected from disease. It is against these ethical criteria that individual aspects of our treatment of animals must be judged. In principle, we can say that any unjustified killing of animals that can feel pain is ethically unacceptable.



Different areas of human relationships with animals require special ethical care. To mention just three: **the treatment of pets, mass animal husbandry, and medical experimentation on animals.** Many people today have pets with which they form strong relationships and attachments. In some homes, pets almost acquire the status of a family member with all the rights that go with it. It is sometimes questionable whether certain forms of human behaviour do not in fact go against the nature of the animal. Of course, man and animal can also be companions and 'friends' who enjoy each other's company and who benefit from each other's closeness and affection. Especially in the relationship with domestic animals, it is often a matter of reciprocal receiving and giving. Animals often have a positive and holistic effect on people, calming them and giving them a pleasant feeling. The therapeutic effects of animal companionship have also been demonstrated.

Another area we want to highlight is attitudes towards livestock farming. As consumers, we share responsibility for the state of animal production and food processing. Through our consumption habits, we maintain a certain production process and indirectly cause unnecessary suffering to many living beings. It is right that we should inform ourselves about where certain food comes from and how the animals' lives have been cared for. We should insist on traceability of information about the entire life cycle of the animal and the production route of the products we buy. We are not sufficiently aware of the power and responsibility we have as consumers to raise the ethical level of our relations with animals. If we were to consciously support those producers who endeavour to ensure that farmed animals have decent living conditions and that their killing is carried out painlessly, then we would gradually change the trends in animal husbandry. Of course, this means that we would have to pay a fair price for the meat, which would be once again higher than the current price.

As a third area, let us examine human attitudes towards the animals used in experiments.

Advances in medicine and pharmaceuticals are also due to animal experimentation, as every innovation is first tested on animals and then on humans. The fundamental ethical question is what criteria can be used to decide that the benefits to humans of the results of experiments can outweigh the pain and harm caused to the experimental animals. Experimentation on animals can only be carried out when there is no other way to arrive at the necessary knowledge for human health. In addition, there must be reasonable assurance that the experiment will be successful and that it will make a significant contribution to medical or pharmaceutical progress. Concern for the welfare of the animals before and after the experiment is also very important. The principles of the triple R (replacement - reduction – refinement) still apply to decisions on animal experimentation. Wherever possible, animal experimentation should be avoided and replaced by alternative research methods (today often computer simulations). Where this is not possible, efforts should be made to reduce animal experimentation: to carry out only those experiments that are necessary.

The third criterion reminds us of the welfare of the individual animal in the experiment and requires us to do everything we can to continuously improve experimental procedures and, as far as possible, to reduce animal suffering.



TOPIC 6: ANIMAL LIVING

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Biology
- Ethics
- Arts
- Philosophy
- Religion

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on the topic 'Animal living', students will be able:

- To understand the relevant aspects of animal interests.
- To acquire and demonstrate knowledge of the similarities and differences between human rights and animal interests.
- To understand the interdependency between humans and animals.
- To demonstrate knowledge about the interaction between animals and the environment.

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on the topic 'Animal living', students will be able:

- To apply bioethical principles in protecting the interests of animals.
- To critically observe the attitude of people towards animals.
- To engage in a debate about the interests of animals.



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on the topic 'Animal living', students will be able:

- To empathise with the animals in complex situations.
- To engage in active protection of the interests of animals.
- To take up a role in the advocacy of the interests of animals.
- To take and share responsibility for protecting the interests of animals.
- To accept responsibility for the fact that their personal decisions impact the welfare of animals and the environment.



COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS



MINIMALIST LIVING



The **minimalist lifestyle means** living with the minimum amount of resources that are necessary for a quality and healthy life. People should determine what gives them the most value and discard the rest as superfluous. The idea is **to reduce the things** that are owned, to open more space both physically and mentally for the things that are truly important to people. A minimalist lifestyle is a choice not to spend more resources than necessary and to focus only on the things that are meaningful and give life meaning. For many people to deprive themselves of the abundance of objects, products, services in the modern consumerist society may seem unimaginable. However, the number of people living according to the principles of minimalism is growing. People choose to live minimalistic lives in order not to overload themselves with unnecessary clutter, not to be distracted from what is truly important to them, and in order to reduce living expenses. As a consequence of the minimalist life, **people have more time to devote to their loved ones, family, friends, community**, and because they use less resources, they also pollute the environment less.

The minimalist life is associated with a selective reduction of work, of communication, of social obligations in order to free more space for the private needs of individuals. The minimalist life means to have things in one's home that serve a certain purpose that is necessary, to live simply, not to fill the home with objects that are not needed in everyday life. The minimalist life protects the environment, saves energy and natural resources, creates less waste, and creates less air pollution. In addition to that, buying fewer products saves money. People with a minimalist lifestyle live more simply and have less stress in life because they worry about fewer things. Less housework means less clutter, less time spent cleaning, and more hours in the day to spend with family.

A minimalist life means more freedom, more time to devote to the truly important things in life, fewer worries about unnecessary things. Among other things, the minimalist life is connected with the organisation of time. It means eliminating unnecessary things from the schedule, leaving space to take a break during the day and being dedicated to the things that are truly important. The beginning of the minimalist life is to assess the things in life that are superfluous and unnecessary. In shopping, minimalist living means buying what is really needed, buying fewer but better-quality products. This will save space for storing the purchased items but will also protect the environment. For example, if someone reads books, he can digitise his library or rent the books from the library.



The transition to a minimalist lifestyle is not easy because it involves giving up many comforts and objects. That is why this process requires commitment and persistence. Achieving a minimalist lifestyle begins with asking four questions: do you need an object that surrounds you?, what is its purpose?, do you use it? and do you want it?. Consider, for example, whether you need a car. In today's consumerist society, many see the car as a necessity. But people lived without cars before the 20th century. Some people still live without cars today. It's not impossible, especially if someone lives in a place with decent public transportation or in a small town. Many people walk, use bicycles and, when necessary, use public transport services. It's healthier for them and the environment.

People should think: Do they have too many clothes? Do they really need five jackets? You do not have to buy new clothes all the time just to follow fashion trends. Perhaps a better alternative is to buy clothes that are classic, that never go out of style. The minimalist life implies that people reduce the obligations they have, keeping and devoting themselves only to the most important ones. The feeling of emptiness that people have after getting rid of unnecessary things is replaced after a while by a feeling of peace and quiet. By getting rid of unnecessary objects, people get rid of clutter in their home, which will become simpler, more orderly, and cleaner.



TOPIC 7: MINIMALIST LIVING

CROSS-CURRICULAR INTEGRATION - INCLUDE THE TOPIC IN SPECIFIC SUBJECT AREAS

- Geography
- Literacy
- Philosophy
- Religious Education
- Sociology

KNOWLEDGE = SCIENTIFIC DATA

Following the lecture on 'Minimalist Living', students will be able:

- To understand the concept of minimalist living
- To know about the ecological limits of the planet.
- To recognise the social/commercial pressures pushing individuals towards overconsumption.
- To know the connection between minimalist living and global justice (social inequalities) and view it through a prism of bioethical principles.
- To identify examples of choices, decisions, personal commitments that lead to minimalist living.
- To demonstrate knowledge of the basic aspects of minimalistic living.

SKILLS = ABILITIES (WHAT CAN I DO)

Following the lecture on 'Minimalist Living', students will be able:

- To reflect the concept of minimalist living in the context of global interconnectedness.
- To be able to engage in discussion about the relationship between bioethics and minimalist living.
- To approach implementing solutions related to minimalist living creatively.
- To discern various levels of minimalist living according to the situation.
- To be able to collaborate with others to promote minimalist living.



ATTITUDES = VALUES AND MOTIVATIONS

Following the lecture on 'Minimalist Living', students will be able:

- To develop a reflected stance on living without certain commodities.
- To be able to make an assessment for themselves which parts of minimalistic living they will apply.
- To be mindful of the future generations' needs.
- To respect the autonomy of individuals in choosing their own lifestyle
- To be open for dialogues with others and take inspiration from them.
- To be committed to protect the environment and quality of life for people locally and globally.
- To appreciate the interdependence between people and the natural environment.



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COMPETENCY FRAMEWORK FOR BIOETHICS IN HIGH SCHOOLS

BIOSEM

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