CURRICULUM
FOR BIOETHICAL EDUCATION AND ATTITUDE GUIDANCE FOR LIVING ENVIRONMENT

Curriculum for Bioethical Education and Attitude Guidance for Living Environment

Authors: Mateja Centa, Josip Guć, Duje Drago Jurković, Antonio Kovačević, Maddalena Nicoletti, Pier Giacomo Sola, Vojko Strahovnik, Nikos Vasilakos.

Cover photo: Samuel Silitonga - Pexels

Acknowledgements

Copyright

Disclaimer

Co-funded by the
Erasmus+ Programme
of the European Union

AGENCY FOR
MOBILITY AND
EU PROGRAMMES

beagle
Bioethical Education
and Attitude Guidance
for Living Environment

TABLE OF CONTENTS

PREFACE

This guidebook represents the core of the curriculum for bioethical education in primary and secondary schools. It is oriented primarily towards the part of bioethics that deals with nature and natural environment and aims to guide and stimulate the proper formation of ethical attitudes towards them. (The topics closer to bioethical questions related to the human body and medical ethics are thus excluded.)

The overall aim behind it was to develop a document for teachers, pedagogical coordinators and other educators that could serve as a self-standing resource and can be used in many school subjects.

The first part introduces the relevant field of bioethics and discusses its dimensions (Chapters 1-3). The second part (six sections of Chapter 4) is more focus on the teaching and learning methodologies that you can utilize, in particular since the goal of the bioethical education is not to merely inform students but to guide and develop their (ethical) attitudes. It contains a description of six methodologies that are well-suited for this purpose.

The third part (Chapter 5) represents the guidelines of how to implement bioethical topics into the existing curriculum and programmes. This was added since it is, in most cases at least, much more feasible to interject bioethical issues in existing schools subject that it is to introduce an entirely new subject. The second reason is that bioethical education must be approached in a transcurricular way. These guidelines are developed both, in a general way as well as (in other languages that this document is written) country-specific for each of the participating countries (Croatia, Greece, Italy, Slovenia).

At the end of the document, there is a list of useful literature and other resources that were used in authoring this guidebook and that you can also use to extend your knowledge and teaching further

1. INTRODUCTION TO BIOETHICAL EDUCATION

Bioethical education concern the part of education that addresses bioethical issues, i.e. issues that stem from the interrelation between biological and ecological knowledge (in the widest sense of the word that includes now only biology but all knowledge and associated technologies that concern life and the context which sustains or enables such life) and knowledge about ethical principles, values and value systems Potter (1970). As it is with bioethics, bioethical education can be further partitioned into domains like land ethics education, wildlife ethics and protection education, medical ethics education etc., but it is best if bioethical education takes the form of a holistic and integrative education and addresses issues about life in particular when applied in early, primary and secondary levels of education.

Life (in all of its forms, with all of its interconnections and even extending through time including future generations) is thus one of the central ethical concepts and also an object of fundamental moral concern. This is why bioethical education is so important, in particular in contemporary world, in which this domain of life seems to be threatened from various sources and directions (e.g. climate change and associated issues having to do with environment, increased diminishing of biodiversity and reduction of some vital biosphere zones and living spaces, possible misuse of biotechnology and genetic technology, advances in medicine that open up critical ethical dilemmas, etc.). Students should, therefore, gain knowledge and skills for comprehensive and responsible ethical reflection, judgment and actions that they could utilize later on.

2. BASIC THEMES AND DOMAINS OF BIOETHICS

Bioethics is a young field that covers many scientific disciplines and cultural perspectives in order to give an answer to certain *moral challenges concerning life*. It is

young due to the novelty of these challenges. Namely, they are mostly caused by the immense growth of *technological development*, when human power became so great that it turned into a serious issue for our responsibility (Jonas 1979). For example, the greater our machinery is the greater power we have to intensify our production, to cut down the rainforests, or to make lives of the farmed animals more horrifying, all of which leads to serious moral and environmental problems. Furthermore, one of the great worries is increasing irreversibleness and ignorance of the possible consequences of certain techniques, where those regarding genetic manipulations of living beings play a significant role. Even though this opened the issue of inviolability of living beings' biological structure, the issue of genetic manipulations on human beings became the most important social issue in this context. Following many other problems regarding contemporary medicine (e.g. euthanasia, cloning, in vitro fertilization, etc.) no wonder that biomedicine and clinical practice became the most prominent bioethical fields – for many bioethicists, also the only domains of bioethics. However, the latter attitude is not addressing the original idea of bioethics, presented by "the father of bioethics", Van Rensselaer Potter, who emphasized that bioethics should cover both medical and environmental issues (Potter 1971; Potter 1988). But already advocates of this limited concept of bioethics were aware that the new moral challenges in biomedicine cannot be faced without an interdisciplinary approach. Moreover, to examine these issues it was clear from the beginning that it must not include only scientific, but also non-scientific approaches. Namely, the lineup of the ethical committee in Seattle Artificial Kidney Center in 1962 (for this case see: Jonsen 1998: 211–217), work of which was marked by many as a birthplace of bioethics, already announced this approach, which is rather called *pluri-perspective* (Čović 2004: 11, 114). The latter forms the methodological framework of the *integrative bioethics*, the concept we lean on in this project. The definition of bioethics in the context of this concept is as follows:

> **"Bioethics is an open field of encounters and dialogue between different sciences and professions, and diverse approaches and worldviews, which gather to articulate, discuss and solve ethical questions concerning life, life as**

a whole and each of its parts, life in all its forms, shapes, degrees, stages and manifestations." (Jurić 2012: 89)

Although this concept implies a great deal of biomedical issues, as well as those concerning human corporeality, sexuality, etc., one of the key fields this notion of bioethics covers is that of concern toward our living environment, on which our project is concentrated. It should also be mentioned that the legitimacy for this broad concept of bioethics rests not only on Potter's writings, but also on later discovered author Fritz Jahr, who, as a matter of fact, first coined the term 'bioethics' (in german: *Bio-Ethik*) in 1926 and dedicated it exclusively to consideration of moral regard toward all living beings (Jahr 2012a). Therefore, following the idea of our project, we will in what follows shortly present basic themes and domains of bioethics regarding our living environment, as well as the way in which those intercept.

One of the central bioethical issue is, of course, the ethical one – do we have moral obligations toward non-human living beings? Depending on ethical theory, the answer to this question stretches from anthropocentric (we have direct obligations only toward human beings), through pathocentric (all sentient beings) and biocentric (all living beings) to physiocentric (everything that exists) paradigm. However, two most common, the pathocentric and the biocentric theories (although the same goes for the others), are not self-sufficient for our moral orientation in living environment. For a start, we should find out which living being is sentient and in which level this quality manifests (the same goes for other morally relevant characteristics). This is important even for biocentric position, for there are always certain conflicts of interests between living beings, where we should decide to which of them we must dedicate our moral action. This task cannot be done without natural science.

Already Jahr stresses that one cannot sensibly protect living beings without knowing their physiological and psychological characteristics, as well as their life conditions (Jahr 2012b: 215). Therefore, natural sciences are intrinsically linked with the broader, non-anthropocentric ethical horizon. Due to the interconnectedness of all elements in

biosphere and complexity of their interrelations, ecology is one of the crucial sciences for bioethics. Of course, this also goes for another great topic of bioethics, and that is a number of environmental issues caused by human irresponsible behavior. In this context, bioethics is without any exaggeration "the science of survival" (Potter 1971) of human kind, due to the overall pollution that destroys biodiversity and life conditions, due to the climate change, etc. – not to mention non-human living beings. In order to bear with these problems, the great amount of technical solutions is required, so that, alongside philosophy and natural sciences, technical knowledge becomes important in bioethical endeavor.

However, technical solutions can deal with the consequences, but never with the causes of noxious human behavior. For that part, the wide sociopolitical and economic field opens for bioethics. In the West, the phenomenon of consumerism is of great importance here. The existing sociopolitical system, the neoliberal capitalism (at least as an ideal toward which globalized world is striving), relies on ever increasing production and consumption of material goods and, in order to promote demand for them, on creating false, artificial needs. On a planet with limited resources, this kind of behavior is nothing more than a madness. Therefore, in order to prevent it, responsible bioethical thinking should work on alternative economic models (even to rethink the common economic dogma of the necessity of constant growth; see D'Alisa et al., ed. 2015). This clearly includes political and legal (also for the other issues, as e.g. animal rights) endeavor, as well as the activist one. Regarding the latter, it should be noted that bioethics is not only an intellectual, but also a social movement, and it emerges exactly thanks to other social movements such as anti-nuclear movement, environmental movement, movements for greater surveillance of medical system, etc. (Zagorac & Jurić 2008: 601–602). Bioethics should also learn from experiences of these movements, but not without critical examination of their demands. It should also learn from certain perspectives which are not directly focused on bioethical issues, but can give important insights for their broader consideration – e.g. feminist thought can be helpful in reflection on the paradigm of knowledge and action which promotes power and avoids responsibility.

This is important for one more important bioethical task: critique of the very paradigm of knowledge and action. It is already instructive in this context that Francis Bacon, one of the forefathers of modern techno-scientific paradigm of knowledge, defines knowledge as a power of mastering the nature (Bacon 2003: 24, 33, 100–101). Therefore, contemporary situation forces us to emphasise responsible knowledge, but to recognize mechanisms that thwart responsibility (and at the same time human freedom), as Jacques Ellul said:

> **"In the whole of our technological society the work is so fragmented and broken up into small pieces that no one is responsible. But no one is free either. Everyone has his own, specific task. And that's all he has to do." (Ellul 1992)**

Overall, in searching for answers on heavy bioethical questions, a bioethicist should consider not only scientific, but also all the fields in which human knowledge accumulated. Therefore, insights from different religions, worldviews and cultures are also of great value, at least as incentives for rational conceptualization of bioethical issues and solutions. The great diversity of many different insights helps us to develop our *bioethical sensibility* (see more on this term in: Zagorac 2018), which is primarily meant as receptivity for the fact that there is a problem, and only then it can be left to rationality to cope with it. This goes both for affirmative stances toward life present in many religions (e.g. the sanctity of life) and manipulations with this affirmative stances (e.g. limiting this sanctity only on human life or ignoring the conflict of interests between living beings). For keeping the bioethical sensibility on a high level, one should also be aware of manipulations of presenting conditions in which living beings are through commercials (e.g. the phenomenon of "happy cows") or the way in which cultural industry presents our needs, also using some cultural stereotypes (e.g. connecting masculinity with eating and preparing meat). Finally, it should not be forgotten that artistic expression kept a special sensibility towards nature, unlike the techno-scientific paradigm. Therefore, contrary to the techno-scientific monopolization

of knowledge, bioethics should introduce valuable insights of artistic sensibility in its record.

Even though there are only a few basic fields of bioethics: (bio)medicine, nature, environment, moral regard over non-human living beings, etc., by pluri-perspective reflection every different approach opens many different subfields and issues that are in some way relevant for the moral questions concerning life. However, there is no point in dividing this fields and subfields in order to have specialized insight in every of them, simply because none of these domains cannot be reflected in a mono-perspective manner. For instance, health is not only a medical issue, it is connected with all the other domains of bioethics. It is a philosophical issue (we are even today not really sure what the health is), an environmental issue (how the pollution effects our health), a sociopolitical and economic issue (which policies and economic framework let this happen and how the healthcare system is organized), etc. And this is only concerning human beings – with introducing health issue of non-human living beings, things become more complicated, even in the anthropocentric sense (on which we should not limit ourselves). For example, the way in which we treat animals in industrial farms and other unhealthy environments often "revenge" on humans, as it is the case with many pandemics, so that "there is scientific consensus that new viruses, which move between farmed animals and humans, will be a major global health threat into the foreseeable future" (Foer 2009: 126–127).

Therefore, it is surely preferable for a bioethicist to have a broad insight in his/her subject. On the other side, nowadays one cannot expect some sort of *homo universalis*, due to the great amount of knowledge needed for this endeavor. Hence the solution primarily lies in pluri-perspective *dialogue* or, in other words, integration of this knowledge. In other words, what is needed, in order to form a unique bioethical view, is an integration of both bioethical themes and approaches from different perspectives (Jurić 2010: 241–242). One of the places where this integration can happen, due to the presence of many people involved in many different sciences, surely is school.

3. BIOETHICAL EDUCATION IN SCHOOLS

The pluri-perspective methodology of bioethics (cf. Jurić 2012) is most helpful concerning the task of incorporating its aspects and topics in various fields of formal primary, secondary and high school education. As an "ethics of life," bioethics should follow the following Hans Jonas' idea: „The phenomenon of life itself negates the boundaries that customarily divide our disciplines and fields." (Jonas 2001: xxiv) Also, a pluri-perspective methodological orientation enables bioethical topics to be included herein various ways. Thus bioethics (here, as it is said in the introduction and as our project is titled, concerns only "living environment") can be thought in scientific way (what is life, human and non-human nature, natural processes, etc.), in artistic way (especially regarding the development of bioethical sensibility), through practice (for the same reason), and finally, and most important, in normative way (which duties we have concerning these phenomena, how we should build our character, etc.). These aspects will in what follows be examined through different school subjects or group of subjects which are not nominally bioethical or directly concerning our living environment. The idea is to offer the teachers the outline of a possible application of bioethical topics in their own school subjects and to stimulate them for finding original ways of implementing these ideas, as well as to find additional bioethical topics to include in their work.

Teachers' job in primary and secondary education should primarily consist of awakening and maintaining the bioethical sensibility of their students. It is important that students learn to recognize a particular issue as a bioethical one, i.e. as an issue that obligates them in a certain way. This goes from simple sensitivity toward animal suffering or clean environment to more complex issues. Many practices on a daily basis can seem as innocent, but recognizing the context in which they are happening, as well as their consequences, prove the opposite. For example, throwing plastic bags in a non-recycling bin can result in the death of a sea animal, buying fruits from distant parts of

the world cause greater CO_2 emissions, etc. More sophisticated acknowledgement of concrete duties they have toward their living environment will probably come in later years of their high-school education, which does not mean that they should not be encouraged to think in a more sophisticated way (with ethical reflection) about these issues earlier. In any case, this sophisticated, rational deliberation over these issues cannot occur if they do not develop bioethical sensibility.

BIOLOGY

The reason for exclusion of non-human nature from our moral concern often rests upon our lack of scientific knowledge about it, or even unwillingness to adopt it. Almost until our times, ethics followed simplistic views on non-human living beings (sometimes also reductionist ones, as the Cartesian idea of animal-machine; Descartes 2006: 46), but with contemporary scientific insights, it is hard to ignore the complexity of living beings or importance of natural conditions for self-realization of both human and non-human living beings.

This first task can be adequately completed through biology/science. Here it is very important to point out similarities of human and non-human living beings, as to indicate modes in which non-human living beings, especially the animals, can be harmed in similar way as human beings. Thus it is not enough to concentrate solely on learning the structure of living being as any other object in the world, but also to stress that they are not mere objects, i.e. that they are in a sense subjects of their own lives, which can be harmed (especially if these subjects are sensible beings) or which are important for the whole biosphere and hence ourselves (especially plants). Biological education should also be performed outside of the school, giving the students opportunity to be in direct contact with their living environment. This will not only expand their scientific knowledge, but also improve their bioethical sensibility.

> **For this purpose you can use materials and tools that are developed in the BEAGLE project. For example workshops like "Tree meditation" or "Be like nature" are focused on preservation of forests and woods, and how can we find**

the balance between the needs of human beings and conservation of the woods. Both workshops can be held indoor or outdoor and are excellent ways to introduce this bioethical issue to the students.

GEOGRAPHY

Although it is both social and natural science, geography in its natural aspect can be most helpful for the mentioned second task, namely, for examining ways in which human actions pollute and generally destroy conditions for both sole life of many living species and their quality of life. Especially important topic here is global warming, as the phenomenon that demands changing our often consumerist and generally irresponsible habits. So this kind of education should not only indicate problems, but give incentive for critical examinations of our behavior. Concrete topics that should be especially stressed are: overuse of plastics, intensive factory farming and overuse of meat (where also health education takes part), overuse of fossil fuels, etc.

Workshop titled "Calm still lake" developed in the BEAGLE project is focused on the issue of water pollution and how human activities cause water pollution. The workshop titled "Breathing" is focused on air pollution and workshop titled "Soil degradation" is more focused on soil pollution. All of these workshops can be held indoor or outdoor and their purpose is to raise the awareness of students for the major causes of water, soil and air pollution, to develop sensibility for the non-human world and to raise the consciousness about interconnection of all natural elements (human beings, non-human beings, environment itself).

TECHNOLOGY AND TECHNICAL SCIENCES

Technology and technical sciences are playing crucial role in our contemporary world and in solving some of the biggest issues we are facing today. For example, technical innovations such as machines for cleaning the plastic waste in oceans, chimney filters, electric cars, solar panels, etc., help us in solving ecological problems such as water and air pollution. The technological development surely should not be neglected in our dealing with the rising ecological crisis. Even though technical education is in many ways important for contemporary social life and also for individual development, there are many misuses of technology that should not be ignored. In other words, technical education should reveal the ways in which human power became so great that it became serious issue for our responsibility (see part 2).

This, as it seems, technophobic approach should not be overall, but it is important that it finds its place in technical education at least out of two reasons. Firstly, primary, secondary and high school students are too young to make any kind of technical device which serve to repair the environmental damage which human conduct generated, even though this kind of education should give incentives to them for future engagement in this endeavor. Also, technical education should favor environment friendly technology. Secondly, students should be taught that technology cannot solve all our environmental problems, i.e. that we should alongside technical solutions change our ways of behavior.

For the technical sciences BEAGLE project has developed the workshop titled "Environmental computing". The workshop is intended for older students from 14 to 18 years old and its main focus is to understand main environmental ethical theories, discuss the impact that the computer technology has on the environment and to consider ideas like green computing and computer recycling.

HISTORY

The ecological issues have their history. For example, global warming has its roots in industrial revolution, when the beginning of excessive use of fossil fuels took place. It is not enough to state this or similar facts, but to broadly (as it is possible on this level of education) examine the reasons why this phenomenon happened (interesting insight in this can be found in: Malm 2016). In that way teachers develop critical thinking and holistic and comprehensive understanding of historical context in their students. In that way the latter can recognize the interconnection between various generations and how actions of contemporary generation can have significant consequences for future ones.

History can also be helpful for bioethics as an insight in various ways in which people in history treated non-human living beings and the reasons why the changes concerning this occurred. For example, one can find connection between nearness toward domestic animals and traditional farming, or their neglecting with technological development and industrial farming. Also, one can observe how "the spread of pet-keeping among the urban middle classes in the early modern period" encouraged them to "form optimistic conclusions about animal intelligence" and "created the psychological foundation for the view that some animals at least were entitled to moral consideration" (Keith Thomas, cited after: Foer 2009: 22–23). If "*historia est magistra vitae*," than these connections can be helpful for finding some of the roots of our misuse of non-human living beings.

RELIGION

Even though most of religions primarily focus on relationship between human beings and the divine, one can find numerous positive guidelines for dealing with non-human nature. Therefore, many insights from history of religions and contemporary religious practices can be used for developing bioethical sensibility. For example, ecologically responsible and toward all living beings sensitive Christians especially refer to Saint Francis of Assisi – including the contemporary pope Francis, as it is stressed in his

ecological encyclical letter *Laudato Si* (Francis 2015). We can also learn from eastern religions, especially from Buddhism and Jainism, for which *ahimsa* (principle of avoiding to harm any living being) can be inspirational for developing bioethical sensibility. Also, the Animism of Native Americans and similar people should not be examined in order to find religious truth or naivety, but to understand what made these people respect nature and living beings in such a way, and discover noxiousness of certain patterns that stand behind the merciless behavior of Western humans toward nature and its beings. With this approach, students can also get incentive for ways in which people from different cultures can find similar language, learn from each other and be more tolerant.

Workshops like "Be like nature," "Calm still lake," "Tree meditation," "Environmental mindfulness," and "Breathing" developed by the BEAGLE project use mindfulness, meditation and other contemplative practices as their educational methods. It is widely known that mindfulness comes from the Buddhist tradition but the modern practice is westernized and has no religious connotations but draws its inspiration from ancient Buddhist and Hindu techniques.

ART/LITERATURE

Besides scientific, not rarely reductionist worldview, the art often kept alive an alternative, sensitive insight into nature and living beings. This is why it should not be overlooked in bioethics, especially in bioethical education. The paintings of landscape, seaside, living beings, etc. often contain artistic sensibility which is in the same time bioethical one. In other words, one can read the artist's wondering and admiration for nature out of such paintings. Therefore, such an incentive for bioethical education should not be overlooked. Experiential learning, as a methodological approach to education, can be used in art education. Learning about environment through some creative experience can be one of the most vivid experiences that students will get to

raise their environmental sensibility. Another methodological approach such as holistic learning can be used in art education. Holistic learning is focused on the whole picture and stresses out interdependence of the earth's living environment. Teachers should primarily encourage students to be creative and to make their own paintings or other works of art in which they can express and maintain their own bioethical sensibility. Thus it is not enough to paint a nice painting of landscapes or animals. Teachers should thematise these works of art, talk with students about their motivation for making them and in that way make emotional background for appreciation of non-human nature.

Many workshops and picture books developed by the BEAGLE project use art as a way of raising awareness about various bioethical issues. For example workshops like "Calm still lake," "Tree meditation," "Soil degradation," "My favorite dog," and all of the picture books use various forms of artistic expression as an educational method to raise the consciousness about different bioethical problems. As an example of holistic and experiential learning through art you can see workshops developed by the BEAGLE project like "Soil degradation" and "Animals and us – Us and animals".

The subjects concerning language and literature are especially fruitful for discussion on the moral concern toward non-human living beings and wider phenomena that influence the level of this concern. For example biographical learning or learning through stories can be implemented in the bioethical education. Starting from first stories we are told in our lives – from fairytales and fables – we meet many anthropomorphized animals. Students here can be thought not only to recognize this anthropomorphism, but also to reflect on its justification. Also, many other literary genres include topics related with animals, nature, etc., which all can be used for developing bioethical sensibility, examining our cultural practices which cause our neglecting of non-human living beings, or even some basic ethical discussion concerning them. As students get older, more personal and biographical stories can be used in their education, which can serve as a tool to develop empathy, respect and responsibility towards the world around them.

PHILOSOPHY/ETHICS

Philosophy and Ethics can add a very important dimension to bioethical education. There should always be room for discussion on moral concern towards non-human living beings in these subjects. Not only there should be ethical examination of interrelation of the human and the non-human, but also ontological and anthropological one. The latter means that one should critically compare the nature of both human and non-human beings, search for their differences and similarities. Also, in search for human particularities it should not be forgotten that human being is also an animal, i.e. human corporeality/animality should be especially examined for this matter.

All the before mentioned approaches can in a way be seen as philosophical ones. As the philosophy is crucial for developing of critical thinking in general, teachers of non-philosophical subjects should either engage in learning some of the basics of philosophy or try to include certain NGOs and researchers that deal with philosophy (for children) in their school activities.

All workshops developed by the BEAGLE project can be implemented in the philosophical/ethical education especially ones like "Bioethical café," "Animal rights," "Animals and us – us as animals," and "Environmental computing," with their main goal of developing critical thinking in children.

CIVIC EDUCATION

Finally, as students will once become citizens with their duties and rights, it is crucial to give them basic orientation about social mechanisms for application of bioethical education. They should get the basic information on institutions which are obligated to care for living environment and on ways in which they can propose changes of our behavior towards it in a pluralistic democratic society. For example we have "UNEP – United nations environment programme which is the leading global environmental

authority that sets the global environmental agenda" *[link]* or Natura 2000 which is the "largest coordinated network of protected areas in the world" *[link]*.

HOW IT ALL COMES TOGETHER?

Bioethical education, finally, cannot adequately be practiced from the perspective of one subject or even without cooperation of teachers from different subjects. That is the reason why intercurricular activities can be most helpful for this kind of education. Every suggested activity can best be done if it includes teachers from various school subjects.

For example, a language and literature teacher can suggest a story or novel that contains a bioethical issue. In the same class, an art teacher will lead pupils in artistic expression of the bioethical content of the issues pupils discussed with the language and literature teacher. After that, philosophy teacher can stimulate students to more critically and deeply examine discussed issues. All this, if the topic is suitable for environment in which school is, can be done outside, in direct contact with living environment, led by a biology/science teacher.

Bioethical education in this way can permeate many school activities and school life as a hole. Namely, it is not necessary that this kind of approach limits itself on a singular class. Therefore, in activities such as cleaning the school environment, done by both students and teachers, the latter can explain the first that this activity is done for number of reasons: esthetic (nicer surroundings), environmental (by explaining noxious consequences for all living beings if no one cleans their environment), ethical and civic (solidarity, responsibility), technical (in finding creative ways of effective cleaning), etc. Furthermore, the students can artistically express this activity and present it in school halls, in school plays or similar events.

4. METHODOLOGICAL APPROACHES TO BIOETHICAL EDUCATION

The subsequent sections contain presentations of six methodological approaches that are particularly well-suited for bioethical education. Each section includes a brief outline of the methodology together with reference to its possible uses in the classroom or learning process in general and a description of its relevance for bioethical education.

4.1. Critical thinking, creative thinking and philosophy with children

What are critical thinking, creative thinking and philosophy with children?

Critical thinking is as old as philosophy itself. Starting with Socrates, who first tried to discover fallacies and errors in opinions of his interlocutors, from Ancient Greece, critical thinking found its way to contemporary classrooms, teaching students not *what* to think, but *how* to think. *Critical thinking* could be defined as a reflection on what was conferred to us and a critical processing which questions prejudice, inconsistencies, stereotypes, and tries to reach good judgment, consistency and validity. (Ćurko 2017, p. 13) While critical thinking uses an analytical basis for finding a proper solution (analysis and investigation of argument, concepts, etc.), *creative thinking*, on the other hand, could be understood as *thinking outside the box,* offering us a different point of view and going beyond. Creative thinking enables us to observe the issues from different angles, in order to find the most suitable solutions. Although *critical* and *creative thinking* can be understood separately, they are intertwined in higher cognitive processes. (Bailin 2003, p. 187) Both *critical thinking* and *creative thinking* were merged together in *philosophy for children,* i.e. an educational strain developed during the 1960's in the USA by Matthew Lipman, who believed that philosophical thinking, together with critical thinking, should be encouraged much earlier in the academic

environment: "To question is to institutionalize and legitimize doubt and to invite critical evaluation. It hints openly of new options and fresh alternatives, in contrast to the stale dichotomy of true/false answers. One must constantly be on the lookout for new ways of encouraging student questioning, not as a matter of habit, but because many practices and institutions, while poorly justified and of dubious merit, can be found out only by creative questioning." (Lipman 2003, p. 99)

How they can be used in the classroom?

There are various ways on how to properly utilize the mentioned methodologies in the classroom. The most common path in which critical thinking, creative thinking, and philosophy with children come together is by implementing different forms of Socratic dialogue. Approaches can be implemented with the help of different types of discussions, dialogues, debates, inquiries, and group talks. Preparing the classroom as a safe environment open for discourse with everyone's right to speak freely without any repercussions, and setting ground rules for the process is of crucial importance in all of the variations mentioned. A teacher has a role of a facilitator/moderator, recognizing and rectifying fallacies and loose assumptions, but not offering definitive answers to the topics discussed or questions raised – showing students *how* to think, not *what* to think. The moderator should maintain its focus on the proper conducting of dialogue, carefully following and reminding direct participants themselves to follow the structure of argumentation. Discussions can be conducted either completely verbally, or participants can use the help of writing paper or blackboard, for easier comprehension and/or conceptualization of stances and ideas.

> **For a demonstrative use of these methodologies, see educational material titled "Bioethical café" – developed as a part of IO2 of this project, Erasmus+ BEAGLE.**

What is their relevance for bioethics?

Serving as a tool of recognizing, revising, and rectifying different stances, values, and attitudes, approaches discussed here can be of key relevance for bioethics. In the same way Socratic *maieutic* held a strong ethical component in its process of questioning life, *critical thinking* and *creative thinking,* with the use of a proper base, can be utilized for bioethical education and attitude guidance. Approaches provided and developed here can be tools to tackle not only highly debated ethical issues and social dilemmas but also ones that we come upon in our everyday life. Being able to properly question opinions and values that are offered in the contemporary surrounding, among others, through an abundance of fast media outlets, means being able not only to recognize various sorts of fallacies and dogmatic opinions but can assist in forming a firm basis of a proper ethical/bioethical stance on relevant issues.

4.2. Experiential and holistic learning

What is experiential and holistic learning?

The starting point of understanding *experiential learning* is the recognition that "learning is the process whereby knowledge is created through the transformation of experience" (Kolb 1984: 38; cf. Kolb & Fry 1975). Experience is a very broad term, so Kolb helpfully further differentiates between four stages of the learning process (forming an ongoing cycle), which are (i) undergoing a concrete experience (new experience or situation, a reinterpretation of existing experience); (ii) reflective observation and engagement with this experience; (iii) abstract conceptualization and formulation of new ideas, concepts, models, patterns, etc., and (iv) active experimentation, application of new knowledge and strengthening of the experience. Experiential is thus learning through reflection on doing and should encompass as broad spectrum of different experiences (intellectual, creative, emotional, social, physical, etc.). *Holistic learning* is a part of a broader concept of holistic education. As a form of

learning this approach principally focuses on the development of a whole person (rational, emotional, physical, social, aesthetic, and spiritual aspects), both from the perspective of the learner as well as the educator (Miller 2000). It emphasizes the interconnectedness between different learning situations, experiences, topics or school subjects, and proposes that one must understand a learning situation as a unity. The learning process should be inclusive, integrative, and creative. It encourages learners to take responsibility for their own learning (intrinsic motivation, learning as naturally inviting, establishing a sense of wonder, wholeness and well-being) and envisions learning process as nurturing the development of the whole person. (Miller et al. 2005).

How it can be used in the classroom?

Both approaches can be combined in a fruitful way and implemented in the classroom. The experiential approach to learning is more analytical and has a more specific focus, since it is connected with concrete experiences, which are always, in a sense, particular and focused. In contrast to this, holistic learning stresses the unity that we must have before our minds that unites particular learning experiences. It is also very personal since it focuses on the person of the student and the person of the teacher. In the classroom first, try to employ a wide range of experiences (staring, e.g. with different senses) and make room for reflection on them. Do not exclude diverging interpretations and always stimulate students to go beyond their immediate experiences (methods of imagining contrasting experiences, contrast cases, role-playing, case studies, field trips, cooperative learning and projects, flipped classroom, etc.).

> **For a demonstration of this see educational material on animal ethics titled *"Animals and Us – Us as Animals"* - activity labelled "Animal classroom", in which both approaches are combined.**

Both experiential and holistic learning approach are very relevant for bioethical education. Starting with holistic learning, it stresses wholeness. This applies to various aspects of the relationship between a given learner and a larger whole (*the community*, where people can relate to one another, foster a sense of care and build relationships based on common values; *the society*, an interdependent structure, in which we are trying to find solutions for common problems, including problems of environment; *the planet*, where planet is understood in terms of ecological interdependence, etc. (Miller 2005) Experiential approach to learning is also very relevant since living environment lends itself to interaction and stimulates most vivid experiences (outside interpersonal relationships). It is a human universal for people of all ages, students of all ages to try to understand the environment around us. As a teacher you can utilize this curiosity and organize bioethical education in the form of experiential learning, connect with the environment and build awareness about its importance and value.

4.3. Biographical learning and learning through stories

What is biographical learning and learning through stories?

Biographical learning is a narrower version of *learning through stories*, a version of "learning within and through one's life history" (Alheit 2009, 125). Stories constitute an important basis in the educational context. Through stories, participants can connect with each other, explore relevant subjects and issues, gather new insights and, participating directly, create new narratives or reassess old ones. By learning through one's personal stories specifically, participants should *be able to reclaim and reconsider the past in order to cope with the challenges of the present* (Hallqvist and Hydén 2013, 2). In that matter, stories and personal histories not only hold educational value, but a social, emotional, introspective, and ethical one. They can be interpreted as a method

towards a better understanding of participants themselves, including three dimensions: (i) implicit, (ii) social, and (iii) self-willed (Alheit and Dausien 2002, 15-16). Method of biographical learning can then be defined as an *autopoietic accomplishment*, an accomplishment of active participants who reflexively organize their own experience. Alheit and Dausien further write how the experience gathered through biographical learning (with the intertwinement of above-mentioned dimensions), "generates personal coherence, identity, a meaning for participant's life history and a communicable, socially viable lifeworld perspective for guiding their actions" (Alheit and Dausien 2002, 17).

How it can be used in the classroom?

Although biographical learning emerged as a part of lifelong and/or adult learning, various types of this educational process based on storytelling can be used for all ages, from children in kindergartens, students in colleges, and later groups. With youngest participants, fairy tales and traditional stories can be used, and as the age of participants progresses, the focus can be moved towards more personal stories, all the way to biographical ones. Using personal stories can also be seen as a good strategy to connect students who are new to one another (Clark and Rossiter 2006, 11). As a strategy of conducting honest and open discourse, biographical learning can be used together with some variations of Socratic dialogue, as a way of addressing one's fears, weaknesses, insecurities, and doubts, in a truthful manner, offering their own life experience as educational material. With all the groups, participants should try to project their own experience into the stories or biographies of others as well. Examples and experiences presented, should serve as an opportunity "of taking a reflexive stance towards presented, as a way of understanding how participants actually use their biographical account(s) as a way of reflecting on their own past". (Hallqvist and Hydén 2013, 4) Leaning on a firm introspective basis, recognizing participant's own mental states, life choices and actions, and discussing them in the open class, biographical learning is to be used in teaching empathy as well, together with responsibility and respect.

For a practical demonstration of this approach, see OER on ethics and values education titled "Manual for Teachers and Educators", chapter 7 labelled "Stories and biographical learning", available online as a part of Erasmus+ project Ethika.

What is its relevance for bioethics?

As approaches connected with the above mentioned sections of experiential learning and critical thinking (see subchapters *4.1. Critical thinking, creative thinking and philosophy with children* and *4.2. Experiential and holistic learning*), and utilizing the same tools such as dialogue, inquiry, and analysis, biographical learning and learning through stories are a relevant part of bioethics and bioethical education. Exploring participant's previous experiences and/or personal stories, this approach serves to reassess one's stances, attitudes, and actions towards the world surrounding us. In doing so, participants reaffirm their ethical choices and values or form new ones (if previous proved fallacious). By engaging in an honest and open discourse in which experiences are shared and questioned in a constructive fashion, biographical learning develops empathy and understanding of ourselves, others and our environment; strengthening at the same time bases of responsibility and respect, together with social and environmental sensibility.

For a practical example on how to use stories with younger age groups, see educational picture book titled "Beagle explores forest", developed as a part of IO2 of this project, Erasmus+ BEAGLE. After reading the book, students can further the discussion with personal examples of relevant experiences.

4.4. Learning through and for research

What is learning through and for research?

Learning through and for research is a comprehensive, transversal, learning-by-doing approach to learning that interrelates research activities with learning experiences. It consists of two main aspects. The first aspect is that students gain new knowledge, understanding and other competencies by researching a particular topic or subject (related both to the subjects itself as well as to research itself). The second aspect also includes students gaining competencies in research (*how to conduct research properly*) but adds to this also a viewpoint of research ethics and integrity (*how to conduct research responsibly*). It stimulates new and creative ways of thinking, and it cultivates problem-solving skills.

Learning through and for research is, therefore, an approach to learning with which we can attain a multitude of learning goals and outcomes. It is particularly relevant for higher levels of education, but it can also be resourcefully used in early education with some adaptations. This approach establishes a good foundation for students who wish to pursue research careers and also affords competencies that are general enough to be used in other domains and careers as well. It is particularly effective as a learning method if the research conducted by students also has real-life consequences and contributes to the solutions of problems in the real world (Benneworth et al. 2017). This can be challenging at times, but you could start with small steps and contributions to the local environment.

How it can be used in the classroom?

If you want to utilize learning through and for research in the classroom, you can begin by first designing the outline of the learning experience that the students will undergo. You can start by first selecting the research problems or questions that you will focus on, followed by the research methods and organization that will be employed. Strive

towards focusing on the research problems that are apt for the educational level of your students and that are highly connected with the environment around them. Try to keep the problem defined at the minimum and let students themselves to lay it out and think about the way to approach it.

Attempt to challenge the students as part of this approach. E.g. during the wintertime, you can pose to students the challenge of finding out which species of birds are most common in the school area and how to responsibly feed them in extremely cold weather. Then let students try to solve these two interconnected problems (e.g. by first reading about which species are local, how to identify them, etc., followed by designing methods of observation, timeframe, etc.) and only assist or help them when they ask you so. Even if you can foresee that their approach will probably not work or will not lead to expected results, let them carry their plan out. It is vital that they can also learn from "failures" or research that is not successful themselves since this is a normal part of the research, and it makes you a better researcher in the long run. It is advisable to split the class into smaller "research groups" so that they can also learn by observing the approaches of others.

Include a discussion about the process and the results at the end given the educational level of students interrelate into this also aspects of research ethics and integrity (e.g. prohibition of manufacturing the data or final results, the importance of giving credit to everyone that contributed to the research, etc.). Stress the importance of the process of research, even if results and immediate impact were absent. You can also interconnect research results with an action-based or practice-oriented project (see also the next section on project-based learning), e.g. in the example above you can build feeding stations for birds based on the findings that the students made in research activities.

What is its relevance for bioethics?

Learning through and for research approach is particularly apt for bioethical education. Nature or living environment around is probably one of the most stimulating research subjects that inspires astonishment, wonder and awe, which are all especially conducive

for learning. Nature is a big laboratory that we can explore. And at the same time, the living environment demands responsible conduct, including responsible research. While carrying out research activities, one must be mindful of the impact this might have on what, but in terms of the subject of research and in terms of the consequences of research. Research can affect living organisms, and we must be considerate regarding possible harm(s) to them (and to the environment in general). Bioethics itself has a strong research ethics component (given that it also concerns research on humans) and while using this approach in the classroom, we can explain the basic ethical posits of research to students.

This approach thus develops a basic vocabulary of values that are at the core of academic and research integrity (e.g. responsibility, respect, fairness, trustworthiness, etc.) and cultivates key moral and intellectual virtues embedded in research integrity (e.g. intellectual honesty, open-mindedness, intellectual humility, intellectual courage, etc.). Using holistic, experiential and practice-oriented teaching and learning all this then gets transferred to the level of attitudes and practices in an everyday school setting.

> **For a demonstration of this see educational materials on environmental ethics titled *"Soil Degradation"* and on animal ethics titled *"Animals and Us – Us as Animals"* - activity labelled "The Network", in which elements of this approach to learning can be found.**

4.5. Project-based learning

What is project-based learning?

The Project-Based Learning (PBL) is a student-centred model of teaching and learning, based on "projects", where teachers make learning come alive for students. Projects can be complex tasks, based on stimulating questions and challenges, involving students in a collaborative way. This can take quite a long period of time – also a week up to a

semester – considering planning, problem-solving and decision making, as well as research activities.

The pedagogical models at the base of PBL are constructivism and social constructivism. A formal definition of Project Based Learning is that PBL is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects. Thanks to PBL, students are expected to develop a deep knowledge of the related content as well as acquire skills in critical thinking, collaboration, creativity, and communication.

How it can be used in the classroom?

In PBL, unlike the face to face lesson, a content is not explained: some elements are given to the learners in the classroom, asking them to solve a real problem, the resolution of which leads to learning other concepts that are not initially known.

The PBL focuses on engaging students in the classroom with real-world problems. This is an interdisciplinary approach because the challenges of the real world are rarely solved using information or skills from a single thematic area. In this way students are requested to engage in research, problem-solving and development of specific products to address the real problem or challenge presented. While students do the work, they often use the knowledge and skills acquired from multiple academic domains to successfully complete the project. In PBL, the role of the teacher moves from content-deliverer to facilitator, or project manager. Students work independently throughout the PBL process, with the teacher providing support only when needed. Students are encouraged to make their own decisions about how best to do their job and demonstrate their understanding. The PBL process promotes the independence of students, the ownership of their work and the development of skills.

Through the project, the students become more autonomous and responsible, develop new skills and apply the knowledge previously acquired. Learning in a meaningful way, the students can create real products, during the development of the project, or can complete their work with a public presentation to a real audience.

The PBL methodology can be effectively applied to bioethical themes since it has been designed to put the students in a condition where they learn to work together, to think critically, to communicate effectively both orally and in writing, and learns the values of ethical principles.

> **Some examples of application of the PBL methodology to bioethical issues can be found in many references, targeting different categories of users, e.g.:** *Incorporating Bioethics Education into School Curriculums;* **Teaching Bioethics to Students of Medicine with Problem-Based Learning** *(PBL)]; Animal Bioethics: Principles and Teaching Methods; How to Best Teach Bioethics;* **Design of PBL cases in bioethical education spanning across general and professional education***.*

4.6. Development of the sense of personal responsibility: Social activism and global movements as vehicles for education

The word "responsibility" derives from "respond". This means that we have to educate children to respond to others and being the respondent of others, e.g. by giving their word to the people they are living with. Developing the sense of personal responsibility means that the children have to understand that it is perfectly useless to complain that everything goes wrong, if we do nothing to make it better. The famous quotation attributed to Gandhi "Be the change you want to see in the world" well presents his ethical message, and the importance to provide a direct contribution to the changes we are expected.

We live in a society whose model of life is based on waste, consumption of resources, plunder of soil. The more consumption increases, the more the Gross National Product (GNP) gets high: this is the basic philosophy of many governments. However different models are desirable, and already in 1968, Robert Kennedy was arguing that GNP does

not measure courage, wisdom, learning, compassion or devotion to our country. He concluded that GNP "tell us everything about America except why we are proud that we are Americans."

In the last few years, more and more young people started understanding that a different model of development is necessary, if we want to save our planet from the environmental catastrophe that many scientists have shown to be the direct consequence of the present model of development.

Emblematic is the example given by Greta Thunberg. On August 20 2018, Greta, a Swedish student, decided not to go to school until the legislative elections of September 9. This decision came from the exceptional heatwaves and unprecedented forest fires that struck this country during the summer. She wanted the Swedish government to reduce carbon dioxide emissions as foreseen by the Paris agreement on climate change. She remained sitting in front of her country's parliament every day during school hours. Her slogan was "school strike for climate". Following the elections, she continued to demonstrate every Friday, thus launching the international student movement "Fridays for Future". She then participated in the Rise for Climate event in front of the European Parliament in Brussels and in other events. Her Friday strikes attracted media attention in several countries and similar demonstrations were organized all over the world.

In this new social climate, teachers and educators should support the development of the sense of personal responsibility towards the environment in their students. This can be done showing many examples: reducing the CO2 emission limiting the circulation of vehicles using fossil fuels; avoiding the use of air conditioning devices in summer and limiting heating of our apartments in winter, reducing the presence of meat in our diets (the water necessary for the full life cycle necessary to produce 1 kg of steak amounts to more than 15.000 litres!!!), increasing the recycling of reusable materials, etc. You will see that all these themes are at the core of any environmental bioethical discussion.

Teachers can challenge their students in debates or involve them in practical activities that will lead them to autonomously reflect about these topics. For

some examples, please have a look at the following educational materials: 1 - workshop on animal ethics titled "*Animals and Us – Us as Animals*" (in particular, activity n. 5 titled *"Care and companionship - A caring companion"*); 2 - workshop on water pollution, titled *"Calm Still Lake"* (in particular, Part n. 3 "*Art work*").

5. IMPLEMENTATION GUIDELINES FOR BIOETHICAL EDUCATION

This section of the guidebook comprises advice and recommendations on how to implement bioethical topics into the curriculum. The aim is either to design a syllabus (as the concrete implementation plan for a particular course that you can then use) or to produce a curriculum for a new course or seminar on bioethics that you can implement alongside existing classes. The principal bioethical issues in relation to the living environment that will serve you as the contents to be included are already detailed above. The same applies to methodological approaches as these are explained in chapter 4. The principal aim of this section is thus not to repeat what was already said, but to give you some advice and directions on how to interrelate bioethics in your teaching and how to plan, organize, implement and evaluate the learning process in relation to these contents and in response to the needs of your students.

The curriculum provides you with broad topics for a given subject, which are usually accompanied by general educational aims. In order to implement a given curriculum, a well-designed syllabus is needed (it can be in a formal form of a course overview and outline or an informal plan that you design and then follow as you proceed). The syllabus is thus different from the curriculum in a way that it represents an operational and concrete plan for carrying out learning activities. The learning outcomes in the syllabus must be more concrete. Concerning specific learning objectives and learning outcomes also think about including an appropriate and concrete way to provide feedback to students, as well as in what ways can students proffer feedback back to you (discussion, think-pair-share activities, minute papers, etc.) in order to influence the effectiveness of teaching further. The syllabus can also take into account the specificities of the situation of the students and context of your country, region or school (e.g. your school is located in or near a national park, or near an area with endangered species, etc.) All these details are important in order to link the learning process with concrete experiences of your students. Next, the syllabus takes into account the available resources and

allocation of time. Lastly, and probably most importantly, the syllabus must consider motivation, aspirations and ethos of the students themselves (Gross Davis 2009; Graves 2000; Riviere et al. 2016).

Design or redesign of the syllabus needs to be centred on the learners and the learning process, which means that you must, first of all, reflect upon learning activities and learning experiences that you want to actualize. You must plan and organize these in detail and assiduously, as well as keep track of the learning outcomes and evaluate them (evidence-based approach). By carefully thinking through and designing the syllabus you will increase flexibility and gain ownership over curriculum in a dynamic and rapidly-changing environment (which is particularly relevant for bioethical issues since they are easily related to current going-on or events, such as climate change protest or social movements, ecological disasters, passing of new regulations or environmental goals, etc.) as well as be able to respond to the needs of your students. In addition to this, you will also extend your autonomy as a teacher or educator. Regarding students, their needs and motivations, it is helpful to include them, at least in part, in designing the syllabus (this is possible in contrast with the curriculum, which is usually already fixed). In this way, the level of their engagement also in the learning process will be much higher. Lastly, it is also sensible to include other stakeholders (e.g. local environmental organizations, organizations against cruelty towards animals, animal shelters, local authorities, parents, etc.) in the process of developing the syllabus.

Bioethical education deals with ethics and values, and since a direct transferal or inculcation of these is not particularly feasible (Strahovnik 2016), it is best to use varied approaches. One of the best strategies is to challenge and intrigue students with problems and important questions so that the students are active participants in the learning process and draw ethical conclusion or lessons on their own.

Syllabus development and implementation processes are highly interconnected and interdependent (see picture below; source: Graves 2000: 3). In what follows we are

proposing you some key steps that you may take and include in them aspects of bioethical education.
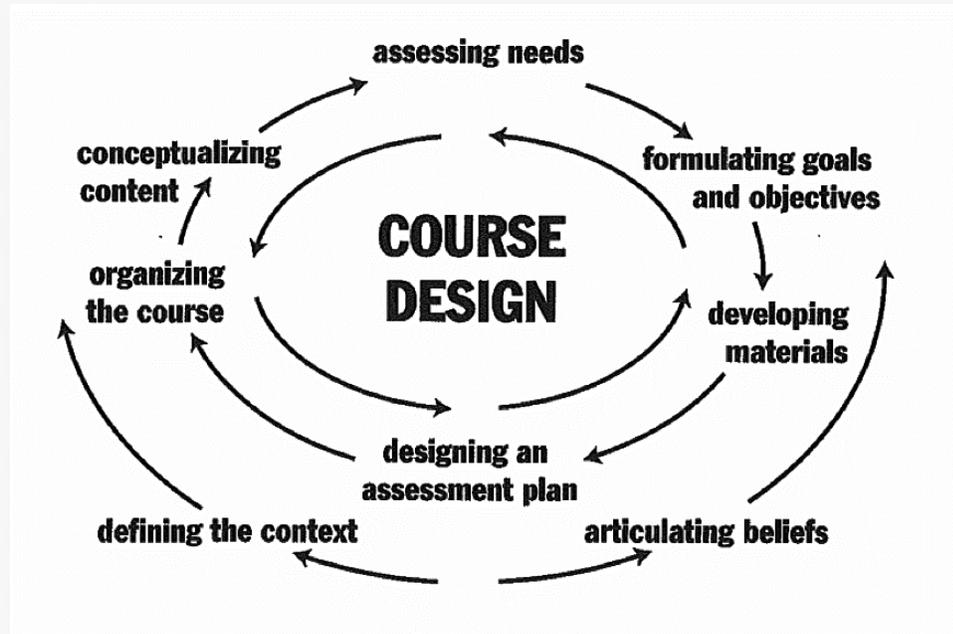
Step 1: Setting the rationale for the inclusion of bioethical topics and defining the overarching context. At the beginning, it is crucial that you define a clear rationale for a given bioethical topic to be included in the syllabus and in this, you must be responsive to the needs of the students as well as others that are part of the educational community. In general, it is easy to find reasons to address bioethical issues such as the protection of our environment that we all depend on, but try to be more specific and answer to yourself what specific issues within these topics you wish to address and why. This will help you to make the learning process much more sensible and engaging to all. In this step, you must also think about resources and any possible limitations, e.g. time constraints, constraints regarding certain activities that take place outside or in a location different than your school, etc. This also how is this particular theme interconnected with your local community. Reflections about aspects of this wider context stimulate learning experiences to be more effective.

Step 2: Defining learning objectives and learning outcomes. Learning objective and learning outcomes can be understood in relation to what the students will know and be able to do after the end of the learning activity. They can also be embedded in the change of attitudes and change in behaviour that are very important for ethical education in general and bioethical education in particular. In defining learning outcomes it is advantageous to use operative verbs such as that the students will be able to identify, analyze, determine, plan, interpret, describe, express, give further examples, relate ..., etc. since this will also make it easier for you to evaluate the achievement of these outcomes. Some of these can also be individualized or differentiated for different students. They must be explained and interconnected into a bigger picture (see step 1) in order that the students can also establish within themselves a sense of meaning and significance of the contents. Some of the objectives can be defined by the students themselves. In this way, you will give responsibility and autonomy to your students and enable them to establish an even deeper understanding of the ethical dimensions embedded in the living environment.

Step 3: Selection of teaching strategies, setup of learning methodologies, organization of learning activities and preparation of teaching materials. The key aspect of this step is the overall design of the learning experience that the students will undergo and will result in a change. Look at your set of defined learning outcomes and first reflect on what teaching strategies you can utilize for each outcome. It might be helpful to list all possible ones for a given learning outcome and only then decide on which ones you will use. Next, focus on teaching and learning methodologies that you may use in order to situate learning experiences (e.g. connect then on a story or narrative that will be easy to follow or will have a surprise ending). Again, try to vary between methodologies. Once you define this, you can go on with a more detailed planning of learning experiences and their ordering. In the end, design and prepare all possible teaching materials that are needed for the implementation of learning. Given that bioethical education and guidance for the living environment is a very broad field that

intersects most of our daily lives you can employ various materials and resources that are perhaps not so common in school life in general.

Step 4: Defining evaluation and assessment activities. Evaluation and assessment are important since they will provide you with valuable feedback. Think of what are the most critical aspects that you need to asses and get feedback on (e.g. achieving learning objectives, addressing the needs of the students, student participation and engagement, etc.). Now, switch roles - in your mind - and think of what feedback (and in which form) would positively matter to students. Try to incorporate many opportunities for such feedback within the learning experiences themselves. For the assessment of students, you can also use peer-assessment and self-assessment, in particular for the topics that are more complex. By using such methods, you will empower students to take responsibility for their own learning, while they will also develop the skill of providing useful feedback to others. Given that the subject matter of bioethical education and guidance for the living environment is such an environment try to use as many cases of direct "feedback" from this environment itself.

REFERENCES AND RESOURCES

Alheit, P. 2009. Biographical Learning – within the new lifelong learning discourse. In Knud Illeris (ed.), *Contemporary Theories of Learning: Learning theorists…in their own words*. London: Routledge, pp. 116-128.

Alheit, P. and Dausien, B. 2002. The double face of lifelong learning: Two analytical perspectives on a 'silent revolution'. *Studies in the Education of Adults*, 34 (1), pp. 3-22.

Bacon, F. 2003. *The New Organon*. Cambridge & New York & Port Melbourne: Cambridge University Press.

Bailin, S. and Siegel, H. 2003. Critical Thinking. In Blake, N. et al. (eds.) *The Blackwell Guide to the Philosophy of Education*. Oxford: Blackwell.

Benneworth, P., Eckardt, F. and Bucholski, M. 2017. The case for learning through research. *University World News*. Available at: https://www.universityworldnews.com/post.php?story=20170307125722706 (accessed December 30, 2019)

Clark, M. C., and Rossiter, M. 2006. Now the pieces are in place…: Learning through personal storytelling in the adult classroom. *New Horizons in Adult Education and Human Resource Development*, 20(3), pp. 19-33.

Čović, A. 2004. *Etika i bioetika: razmišljanja na pragu bioetičke epohe*. Zagreb: Pergamena.

Ćurko, B. 2017. *Kritičko mišljenje u nastavi filozofije, logike i etike*. Zagreb: Hrvatsko filozofsko društvo.

Descartes, R. 2006. *A Discourse on the Metod of Correctly Conducting One's Reason and Seeking Truth in the Sciences*. Oxford: Oxford University Press.

D'Alisa, G. & Demaria, F. & Kallis, G. (eds.). 2015. *Degrowth: A vocabulary for a new era*. Abingdon & New York: Routledge.

Ellul, J. 1992. *The Betrayal by Technology: A Portrait of Jacques Ellul: Interview by Jan van Boeckel and Karin van der Molen*. http://www.naturearteducation.org/R/Artikelen/Betrayal.htm.

Foer, J. S. 2009. *Eating Animals*. New York & Boston & London: Back Bay Books & Little, Brown and Company.

Foer, J. S. 2009. *Eating Animals*. New York & Boston & London: Back Bay Books & Little, Brown and Company.

Francis. 2015. *Encyclical Letter Laudato Si' of the Holy Father Francis on Care for our Common Home*. Vatican: Vatican Press.

Graves. K. 2000. *Designing Language Courses: A Guide for Teachers.* Boston, MA: Heinle & Heinle.

Gross Davis, B. 2009. The Comprehensive Course Syllabus. *Tools for Teaching, 2nd ed.* San Francisco: Jossey-Bass, pp. 21-36.

Hallqvist, A. and Hydén, L.-C. 2013. Work transitions as told: A narrative approach to biographical learning. *Studies in Continuing Education*, (35), pp. 1-16.

Jahr, F. 2012a. Znanost o životu i nauka o ćudoređu (Stare spoznaje u novom ruhu). In I. Rinčić & A. Muzur, *Fritz Jahr i rađanje europske bioetike*. Zagreb: Pergamena, pp. 197–200.

Jahr, F. 2012b. Zaštita životinja i etika u svom međusobnom odnosu. In I. Rinčić & A. Muzur, *Fritz Jahr i rađanje europske bioetike*. Zagreb: Pergamena, pp. 213–218.

Jonas, H. 1979. *Das Prinzip Verantwortung: Versuch einer Ethik für die technologische Zivilisation*. Frankfurt am Main: Insel Verlag.

Jonas, H. 2001. *The Phenomenon of Life: Toward a Philosophical Biology*. Evanston, IL: Northwestern University Press.

Jonsen, A. R. 1998. *The Birth of Bioethics*. New York, NY: Oxford University Press.

Jurić, H. 2010. *Etika odgovornosti Hansa Jonasa*. Zagreb: Pergamena.

Jurić, H. 2012. Multi-Disciplinarity, Pluri-Perspectivity and Integrativity in the Science and the Education. *The Holistic Approach to Environment*. 2 (2): pp. 85–90.

Jurić, H. 2012. Multi-Disciplinarity, Pluri-Perspectivity and Integrativity in the Science and the Education. *The Holistic Approach to Environment*. 2 (2): pp. 85–90.

Kolb, D. A., & Fry, R. 1975. Toward an applied theory of experiential learning. In C. Cooper (ed.), *Studies of group process*. New York: Wiley, pp. 33–57.

Kolb, D. A. 1984. *Experiential learning: Experience as the source of learning and development (Vol. 1).* Englewood Cliffs, NJ: Prentice-Hall.

Lipman M. 2003. *Thinking in Education*. Cambridge: University Press.

Malm, A. 2016. *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming*. London & New York: Verso.

Miller, J.P., Karsten, S., Denton, D., Orr, D. & Colalillo Kates, I. (eds). 2005.Holistic Learning and Spirituality in Education.New York: SUNY Press.

Miller, R. 2000. A brief introduction to holistic education. *The encyclopaedia of informal education*. Http://infed.org/mobi/a-brief-introduction-to-holistic-education/ (Accessed: December 10, 2019).

Natura 2000; https://ec.europa.eu/environment/nature/natura2000/index_en.htm.

Nilson, L. B. 2007. The Graphic Syllabus and the Outcomes Map: Communicating Your Course. San Francisco: Jossey-Bass.

Potter, V. R. 1971. *Bioethics: Bridge to the Future*, Englewood Cliffs, NJ: Prentice-Hall.

Potter, V. R. 1988. *Global Bioethics: Building on the Leopold Legacy*. East Lansing, MI: Michigan State University Press.

Potter, VR. 1970. Bioethics, the Science of Survival. Perspectives in Biology and Medicine 14(1), pp. 127-153.

Riviere, J., Picard, D. R., & Coble, R. 2016. Syllabus Design Guide. Http://cft.vanderbilt.edu/guides-sub-pages/syllabus-design/ (Accessed: December 10, 2019).

Strahovnik, V. 2016. Ethics and values education. In: Peters, M. A. (ed.), *Encyclopedia of Educational Philosophy and Theory*. Singapore: Springer, doi: https://doi.org/10.1007/978-981-287-532-7_167-1

UN Environment Programme; www.unenvironment.org/about-un-environment.

Zagorac, I. & Jurić, H. 2008. Bioetika u Hrvatskoj. *Filozofska istraživanja*. 28 (3): pp. 601–611.

Zagorac, I. 2018. *Bioetički senzibilitet*. Zagreb: Pergamena & Znanstveni centar izvrsnosti za integrativnu bioetiku.