

---

## **Education for cultivation of awareness as an important factor of raising environmental consciousness**

---

**Harisios P. Ganatsios\***

School of Forestry and Natural Environment,  
Aristotle University of Thessaloniki,  
PC 54124, University Campus,  
P.O. Box 268, Greece  
Email: cganats@for.auth.gr  
\*Corresponding author

**Anastasia F. Filippou**

Faculty of Philosophy,  
Aristotle University of Thessaloniki,  
PC 54453, Pasaleti 21, K Toumba,  
Thessaloniki, Greece  
Email: nitya\_he@yahoo.gr

**Sofia Mpekiri**

School of Forestry and Natural Environment,  
Aristotle University of Thessaloniki,  
PC 54124, University Campus,  
P.O. Box 268, Greece  
Email: sofiampekiri@gmail.com

**Kate Evelyn Danahy**

Massachusetts Institute of Technology,  
15 Lawrence St Cambridge Ma 02139, USA  
Email: kateedanahy@gmail.com

**Abstract:** This research aims to illustrate the importance of cultivating awareness in raising environmental consciousness, and to provide effective tools to overcome educational barriers by presenting a new educational paradigm based on the integration of concepts of holistic education and yoga, epistemology and findings from neuroscience. A university holistic curriculum based on powerful techniques was created, the assessment of its effectiveness in cultivating environmental consciousness was the challenge of taking action, and proved to have a significant qualitative impact on the students, by bringing balance between actions, thoughts and emotions. A group-administered

questionnaire survey was included, given in three student groups of Aristotle University of Thessaloniki, Greece. Developing environmental relationships was the key of the success of this program and the most highly requested by students and the reason for taking action. Initially, students showed difficulty with forming groups and taking collective action. Two groups received training, one of them succeeded in developing a connection with nature.

**Keywords:** awareness; environmental consciousness; educational and scientific barriers; holistic education for sustainable development; deep transformation; yogic techniques; higher education; yoga.

**Reference** to this paper should be made as follows: Ganatsios, H.P., Filippou, A.F., Mpekiri, S. and Danahy, K.E. (2021) 'Education for cultivation of awareness as an important factor of raising environmental consciousness', *Int. J. Higher Education and Sustainability*, Vol. 3, No. 3, pp.231–265.

**Biographical notes:** Harisios P. Ganatsios received his PhD in 2004 on the Interactions of Forest Utilisation and Forest Ecosystems and currently works at the Aristotle University of Thessaloniki as a member of the Teaching Staff at School of Forestry and Natural Environment. He teaches environmental education, sustainability and forest utilisation, with a focus on water and soil management. His teaching aims at empowering students to lead a more sustainable way of life, through example and action. His involvement in applied research has also led to the creation of many multipurpose dams and environmentally friendly constructions.

Anastasia F. Filippou graduated from the School of Philosophy of Aristotle University of Thessaloniki. For more than 25 years, she is keenly interested in the natural environment, and embraced a way of conscious living towards sustainability. Her life towards this goal involves empowering and inspiring people (organising and teaching in classes, workshops, seminars, conferences), living a more natural way of life.

Sofia Mpekiri is currently (2019) an undergraduate student at the School of Forestry and Natural Environment, AUTH, focusing on the economics of sustainable forest utilisation. Alongside her studies, she tutors students in English as a second language and has a lifelong love of creative writing. Through her work and studies, she developed an interest in the psychology of teaching, and the role of education, literature and art in overcoming emotional and behavioural issues. After graduation, she plans to get involved in research regarding the education of adults on the economics of sustainability and practical solutions for the protection of the environment.

Kate Evelyn Danahy received her degree in Creative Writing and English from Gordon College in 2013. She worked as a Teaching Assistant and a Writing Tutor in the faculty of Philosophy at Gordon College from 2012 to 2013. She went on to work as a teacher at Kodaikanal International School, India from 2014 to 2015, where she used her love and knowledge of English literature to assist students in learning self expression, facilitating social and psychological skills necessary for their future success and well being. Currently, she works at the Massachusetts Institute of Technology (MIT), and continues to pursue her interest in literature and education.

---

“We cannot overcome our limitations and problems on the same level of thought which created them. Our minds have to be transformed”.  
(Albert Einstein)

## **1 Introduction**

The relationship between people and the environment has in recent years become the centre of interdisciplinary and multicultural discussion. While this relationship is in itself a complicated issue, the global state of crisis – economic, environmental, health – that we are facing, puts particular strain on state and educational institutions to develop better methods of environmental education.

Very few evaluations with a broad enough scope have been made on the success of integration of environmental education (E.E.) in higher education. A recent report on the first evaluation done on all higher education institutions in Sweden (the first country-wide evaluation) about environmental education integration concluded that “lack of content, didactic and pedagogic competence among teachers is a major challenge at the higher education institutions” (Finnveden et al., 2020). Another recent study amongst eight European universities in seven European Union countries also found that students’ interest in sustainable food development (an important facet of sustainability and environmental education) had very strong associations with the teaching of competencies for making judgements and justifying decisions and innovation and creativity (Migliorini et al., 2020).

The Global Action Programme (United Nations, 2015) on education for sustainable development, aimed to contribute substantially to the 2030 agenda through two objectives:

- a reorienting education and learning so that everyone has the opportunity to acquire the knowledge, skills, values, and attitudes that empower him/her to contribute to a sustainable future
- b strengthening education and learning in all agendas, programs, and activities that promote sustainable development.

It appears that where E.E. programs have been adopted, there are several barriers hindering their effectiveness: lack of follow-up, lack of organised leadership and partial solutions; also, a lack of educational tools and frameworks available to educator’s present significant barriers towards effective environmental education in higher education institutions (Finnveden et al., 2020). A literature review on the effectiveness of E.E. revealed the following barriers.

### *1.1 Barriers towards effective environmental education*

Traditional approaches in E.E. have focused on providing a plethora of information regarding how the environment functions, the articulation of environmentally friendly practices and the multitude of challenges we face as a species if we fail to alter our lifestyle, individually and as a whole, by adopting these practices. In our research, we identified these key interrelated barriers to the effectiveness of E.E. as it is largely employed over the world:

- flood of information and inadequate cultivation of discrimination and understanding along with the fragmentation of science and poor communication between scientific fields
- competitive educational system, stemming from the competitive nature of our social system
- mental and physical isolation from nature
- perpetuation of the crisis, leading people to become overwhelmed and develop apathy.

### *1.1.1 Flood of information and inadequate cultivation of discrimination and understanding and Fragmentation of science and poor communication between scientific fields.*

The topic of the environment, its functions, characteristics and deeper nature, is vast. Modern science has made amazing advancements in analysing the numerous components of nature, how they all relate to one another and how they are affected by each other. So far, the common method has been to employ a rigidly structured division of educational disciplines, each focusing on a particular aspect of nature and the environment. This creates though a flood of technical information that any one person is unable to absorb, to think critically about and much less to understand. Finnveden et al. (2020) suggested that higher education institutions should not focus only on content. Overemphasising specialisation and quantity (instead of quality) of knowledge objectifies and fragments science beyond the ancient Greek doctrine of ‘everything in moderation’. As quoted in B. Gita (Vyasa, 2nd BCE, reprint 2007), “see multiplicity, not duality”, that is, education must not limit us to seeing ‘trees’ rather than the ‘forest’. Despite the prevalence of science today, we should not accept the limited view we have created with it, and instead seek to build a science that provides us with the whole picture (Satyasangananda, 2013).

Critical thinking requires a basis upon which to discriminate between relevant and irrelevant information, needs from ambitions, necessary from unnecessary, true from false, in order to make informed decisions about our relationship with the environment and our way of life. Information about the environment is relevant to human life when it pertains to the deep understanding of our relationship with it. The question of how the environment affects us and how we affect it in return needs to become the essential cornerstone of modern environmental education. According to Giroux (2010), an understanding of education as a practice of freedom “a holistic analysis of the relationship between man, society, its culture, and nature” hardly finds a place in today’s market mandated educational paradigm.

Many participants of environmental initiatives have failed to employ conservation tips for lack of understanding why or how. This shows campaigns which aim at merely informing rather than introducing awareness as the essential developing tool towards environmental understanding and thus behavioural change are not sustainable. The fact is many individuals remain indifferent to environmental action despite the correlation between knowledge and understanding in research (Potter, 2009; Steg et al., 2014; Hornik et al., 1995; Pelletier et al., 1998; Wi and Chang, 2018). While many advancements have evolved within separate educational strands, a holistic approach to the various aspects of sustainable wellbeing has been lacking (Ronen and Kerret, 2020).

As mentioned above, in order to navigate the wealth of knowledge that science has uncovered about nature, specialisation in fields and particular topics is employed, with the aim to produce information and knowledge at an ever-accelerating rate. According to Žuk and Žuk (2018) education has adopted the mass production and consumption characteristics of the economy and thus, students are unable to understand environmental risks. The aim of higher education seems to be the production of ‘super specialists’, people with massive knowledge on a particular scientific topic, and the ability to come up with one-size-fits-all solutions to environmental, social and economic crisis, such as the broad advertisement of environmentally friendly products (Žuk and Žuk, 2018). These specialists however, inspired by personal conviction, often do not advance society and science, but rather achieve social and material success as dictated by external conditions imposed on them, while questions about the meaning of life usually escape them (Žuk and Žuk, 2018). Thus, these authors report there is little room within universities to contest this logic, since modern education has taken on the mass production and consumption characteristics of the economy and this is one of the reasons education has failed to make ecological behaviour into a lasting social change.

Alongside this fragmentation, comes poor or absent communication between scientific fields, which are evident in modern man’s inability to critically evaluate the flood of information offered. From this lack of undivided understanding of nature often arise environmental issues, since we view science as a way to perfect assembly lines for feeding corn to cows. It never occurs to ask “is eating cows good for our survival?”. Poor training in scientific content related to sustainability can be a limitation to education and a barrier to changing attitudes, thus Universities, should be the main agents of change providing answers to the problems and challenges of today’s society (Martínez-Borreguero et al., 2020). Although quality education is one of the 17 United Nations sustainable development goals, lacking modern and effective content for environmental sustainable development (Glavič, 2020).

### *1.1.2 Competitive educational system, stemming from the competitive nature of our social system.*

The increasing fragmentation of science takes place in the larger context of an increasingly competitive educational system. Societal values and scientific ideas are closely inter-connected in the human mind. This can mean that an extremely competitive society can influence education (and science) into adopting the same form. Thus, our educational and social systems discourage cooperation and communication.

Under these conditions, it is hard to expect that universities will promote sensitivity towards other beings, the natural world and care for ecosystems; financial performance becomes the main criteria for assessing the correctness of actions (Žuk and Žuk, 2018). Universities should serve the development of social and self-awareness and facilitate social criticism (Žuk and Žuk, 2018), which has not so far been a significant part of environmental education. Universities are not doing enough efforts in sustainable development (Glavič, 2020). As a result, we observe the general ineffectiveness of current E.E. paradigms to produce deep understanding and lasting changes in human behaviour.

### *1.1.3 Mental and physical isolation from nature*

In this era of communication, loneliness and human separation have become major problems. Students are sceptical of working with their peers and working in harmony with nature. The knowledge of nature's functions is there, but as modern humans live isolated from nature, we thus have limited awareness of how interconnected and interdependent nature is with daily life.

In fact, science itself is perceived as disconnected from the world, with objectification being its core tenet (Littledyke, 1996, 2008). However, the tendency to objectify if not balanced with emotion, permits us to perceive ourselves as being above nature and therefore contributing to environmental problems (Littledyke, 1996). For Satyangananda (2013), no species other than humans have misused nature, and are forced by ecosystem disturbances bouncing back to us to finally think deeply about ecology. The scientific minded individual has lost his link with nature. He should expect science to connect him to his environment into the unified field, the ecosystem to which we are part of. Today there is a superficial and selfish understanding of ecology. An anthropocentric resource management, a 'shallow environmentalism' is likewise misguided (Littledyke, 2008).

Mental isolation from nature is perhaps even more destructive than the physical. As Satyananda stated (republished in 2016), "The external environment is only the reflection of inner environment and nature is out of sync because human nature, mind, and emotions, thinking and acting are out of sync. Individual minds are part of the collective mind. Individual mental sickness and collective mental sickness can lead to disaster. When the body is ill, we are aware of it and take care of it. When our mind is ill, we do not know it and we do not take care of it. We only live in a world of matter but the subconscious mind and the deeper layer of our subconscious ultimately become responsible for the expressions of life".

The mind is the powerful creator of people's reality, and by extension, society's. Understanding of the world as mind projection (Plato cave) is necessary. Neurophysiology and quantum physics confirm we influence the complex interactions we observe. There can be no objective understanding of our inherently uncertain reality (Littledyke, 2008). But not everybody perceives the physical world in the same way. Perception is a creative process. On a neuro-scientific level, the reticular activating system in the brain, filters incoming information, allowing in what matches the pre-existing mental programming and rejecting what does not, even if it is beneficial. As Danezis and Theodosiou (2012) explained, "that means we see our environment not as it really is but as our senses allow us to perceive it. Logic, as proved in the incompleteness theorem (Gödel, 1931), is based on very basic human assumption and so the birth of science begins with intuition, not absolute logic".

If we view nature as an abstract scientific concept, foreign to our daily lives and inner experience, how can we hope to develop care and awareness towards it?

### *1.1.4 Perpetuation of the crisis, leading people to become overwhelmed and develop apathy*

Despite the indispensable development of ever more sophisticated methods for sustainability, the many environmental initiatives have failed to inspire participants to employ conservation tips, as they lack understanding of how and more importantly why.

Besides the previously mentioned barriers to understanding and behavioural change, researchers have identified time and again an aspect of apathy that worsens our natural resistance to change. The flood of information about environmental issues, the inability to critically evaluate and understand this information and the ineffectiveness of education on behavioural change, perpetuate the crisis while also keeping us keenly and constantly aware of the imminent dangers in our future. Naturally, we have individually and in society at large developed a level of apathy in order to withstand the enormous emotional and mental pressures this confusion creates. This detached perspective renders us incapable of fundamental changes in attitude and behaviour (White, 1967) the result of which is an endless vicious cycle of confusion, frustration, inaction and further destruction.

## *1.2 The aim of this research*

The *aim* of this research is to illustrate the importance of cultivating awareness in raising environmental consciousness and promote a holistic environmental education as integral part of our lives. The main goal of this proposed educational paradigm is to facilitate amongst students, a cooperative spirit and respect for nature through understanding the unified field that permeates all.

Students of the School of Forestry and Natural Environment (F&NE) of Aristotle University of Thessaloniki, Greece, serve as the target group of this study. Understanding sustainability is the major educational goal in the School of F&NE.

The aim of this paper is to contribute in the development of such an educational framework in a higher education setting that can serve as a paradigm for educators and institutions seeking to increase environmental awareness in their students and provide them with the skills they need to change their behaviour towards the natural and social environment.

We began by identifying possible gaps in the E.E. programs we have observed so far, which are listed below:

- a lack of environmental awareness
- b lack of social skills necessary for cooperation and group action
- c inadequate or absent education on matters of ethics.

In order to define an educational program that addresses these issues, we first had to clearly define the concept of environmental awareness. To this end we assembled a theoretical background on awareness.

## *1.3 A theoretical background on awareness*

### *1.3.1 Awareness in general literature*

According to the Belgrade Charter on environmental education, the goal of E.E. is to develop a world population that not only is aware of and concerned with environmental problems, but also has the knowledge, skills and attitudes to work towards solving them (UNESCO, 1976; UNESCO and UNEP, 1977).

According to Littledyke (2008) reflective awareness takes place on three levels:

- a self-awareness: how one's actions impact the environment
- b social awareness: how people interact socially to influence consumer and living choices
- c environmental awareness: how society impacts ecosystems through political choices.

Žuk and Žuk (2018) and Bergman (2016) also talk about eco-impact awareness as the understanding of the link between lifestyle and improving our immediate environment, which characterises our level of education and behavioural attitude. A comprehensive meta-analysis of positive schooling recently conducted by Waters and Loton (2019) also identified awareness as the one of the six components of wellbeing: identification of strengths, emotional management, attention and awareness, relationships, coping, and habits and goals.

For Steg et al. (2014), “creating awareness in the individual by learning about environment and action, giving them an opportunity to exercise and practice the new knowledge, and supporting them to perform the action are important ingredients to influence behavior positively”.

Knowledge can include environmental awareness, environmental perceptions, awareness of global connections, awareness of social activism, conceptualisations of the environment, environmental issue awareness, etc. (Stern et al., 2014; Ardoin et al., 2018). For Steg et al. (2014), awareness is a change in the cognitive recognition of issues.

### *1.3.2 Awareness in yogic literature*

A research on awareness is incomplete without seeking guidance from the science of awareness cultivation. Awareness leads to understanding, one of the most precious human qualities, and therefore to the union of thoughts, feelings and actions (Niranjanananda, 2018). Evolution of awareness underpins all stages of understanding, which, according to the science of yoga are: detachment, discrimination, acceptance, control of negative expressions and finally understanding. Through this evolution, awareness expands and consciousness rises.

Unless we manage the mind at the physical, mental, emotional and spiritual levels we cannot solve environmental problems, and for that there ought to be a science. Science is a sequential process of mental understanding, based on observation and analysis, today still in its infancy. Yoga on the other hand, the name for ‘unity’, is a sequential process of experiencing the positivity within oneself, at any rate an old science. Why not harness its experience? (Niranjanananda, 2016, 2015).

The yogic lifestyle is based upon the precepts of practice, awareness, attitude, and action. Awareness is the torchlight of consciousness, the ability to live in the present, to witness and understand ourselves (including detachment and discrimination) and the environment, conditions, and events that influence us. Attitude involves the ability to develop a positive and creative outlook by converting everything negative into its opposite and encourage others to do the same. Action entails an understanding of how we act, think and interact in the world, through discrimination between just and unjust, right and wrong, appropriate from inappropriate, universal and limited. When awareness grows, man's thoughts, concepts and values also change (Satyananda, 2018). Through awareness, an understanding of this process and its outcome begins to develop and in the end gain control over our own inner expressions, experiences, reactions and our

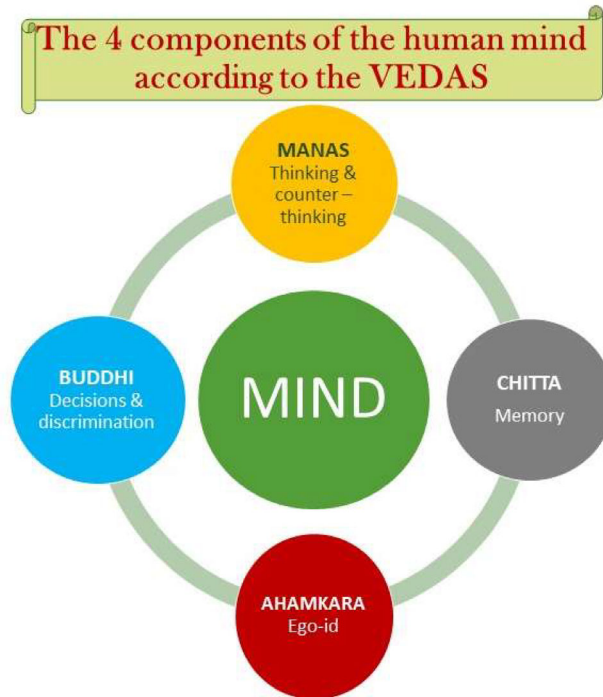


circumstances. Awareness is in fact a natural process of the mind, the faculty by which the mind sees everything and can focus on anything.

Satyananda (republished in 2017) describes four tools of awareness according to Vedanta:

- 1 thinking and counter – thinking
- 2 decisions and discrimination
- 3 remembering
- 4 ego or id (Figure 1).

**Figure 1** The human mind according to the VEDAS (see online version for colours)



These tools employed, allow us to perceive the whole picture, instead of the few pieces of the puzzle that are represented by various scientific disciplines. Knowledge comes from outside, while awareness is an inner ability. It means ‘to know what I know’ but through it we can evolve much further. The mind is made of the thinking, the thinker and the thought, but yoga identifies a fourth component: the seer of it all, the part of ourselves who is constantly observing. The emotional state is an important event that is associated with the learning process. This implies that neural circuits that generate certain emotional states become associated with the neural circuits that generate thought processes like decision making, perception, communication, and movement production. To be aware, to ‘know what we know’, the ‘seer’ cannot ignore the emotional state.

For this reason, emotions have the ability to shape the brain in a way that influences decisions, world perceptions, communication, etc. By focusing all our attention to this,

education can train the brain to act (through activation of evolved brain areas) and not react (triggered by fear or anger of amygdala and other less evolved parts); and awareness is the link to this higher intellect. Awareness frees us from falling victim of the impulsive behaviour of the mind (Immink, 2007). Concentration and the ability to learn improves, the software of mind based upon the hardware of the brain transforms and evolves. Thoughts, words and actions become aligned. Awareness over time and through training and application illuminates and mollifies conflicts within ourselves and our relationship with nature.

The link made in yogic principles on awareness and emotion is also reflective in modern findings of neuroscience. Immink (2007) mentions that since the brain has no sensory system for itself, thoughts can only be detected by observing them with another thought. Furthermore, Newberg and Waldman (2009) conclude that this very act of self-observing, conducted in the frontal lobes, reroutes brain activity from the limbic system – the older, reactionary part of the brain, where anger and pain are generated – back to the more recently evolved frontal lobe, which is responsible for higher functions like care, compassion and deeper understanding (i.e., awareness). Activation is related to increased flow of bioelectrical energy through the nervous system. Energy flows where attention goes.

So, this lack of training the brain on cultivating awareness reduces the effectiveness of E.E. and has been largely ignored so far.

#### *1.4 Education – a way out of crisis*

To overcome our limitations and problems, any crisis in general is to overcome environmental problems, and for this our minds have to change, to be transformed. But the question remains: have we transformed our minds to find practical solutions, or are we, despite all effort, heading for a dead end?

Human behaviour towards nature largely depends on the level of their consciousness, the system of values, cultural patterns, sensitivity, character, education, etc. It is possible to transform the mind through education. Today more than ever educators need to adapt and rectify educational systems to fundamentally re-inform environmental perceptions and understanding of nature. What is the nature of pedagogy required to facilitate this? For Steg et al. (2014), “education has to focus on the need of understanding the given information rather than providing too much information”, that is, an education aimed at raising environmental consciousness requires a shift in the way educators conceive people, reality and education itself. Decades of research concludes that gain of knowledge and the cognitive transmission of skill do not directly cause behavioural change (Mezirow, 2000; O’Sullivan, 2003; Hungerford and Volk, 1990).

Learning today is primarily focused only on the cognitive and rationality aspects of the multi-dimensional human being. The curriculum aims at developing the mental faculties of the learner and transmits prescribed knowledge. Our challenge is to cultivate, through morality and scientific education, a critical awareness of our personal and political choices and thus inspire action towards environmental sustainability. An EE of ethic, aesthetic and spiritual values must ultimately become integral to all university courses and all curricula in general (Devuyst and Hens, 1990; Petegem et al., 2007). Meeting basic human needs, now and in the future, requires a significant change in the thinking, values and actions of all people and institutions with respect to the natural environment (Martínez-Borreguero et al., 2020). The challenge is timely evolution of the

human society towards a deep transformation. Profound changes in the human mind are required to achieve de-growth and education can and must play the most important role in this development change (Glavič, 2020).

## **2 Methods**

Within the framework of the educational program on the environmental impacts of forest utilisation (EIFU), the following main educational tools were explored:

### *2.1 Class workshop*

In a class workshop, emphasis was put on internal relations and dynamic interactions in the complex natural ecosystems:

- EE helps us understand that all systems are interconnected and influence one another, mirroring the dynamic causal interaction between nature and the universe upheld by quantum physics (Littlelyke, 1996; Potter, 2009)
- there are social and environmental implications to the practical application of science, which highlights the need for responsibility by scientists
- understanding our place in the universe created a sense of beauty and awe and excitement for learning.

The basic course plan includes:

- a historical review of non-sustainable management paradigms of natural environment, leading up to an analysis of the current situation
- b relationships between forest utilisation operations, economy, markets, ecosystems and developing connections between these components and also in relation with students' lives
- c evolution trends
- d the role of the forester
- e the role of education
- f problem identification
- g working on solutions, team empowerment, focusing on inspiration and realisation of students' dormant potential.

History repeats itself and it is a challenge to study and learn to discriminate and understand the lessons of the past. One precious lesson is that it is not necessary to go through the same mistakes of our ancestors all over again. Most of the students are unaware of their own inner conflicts and refer every problem to an external cause, thus making others responsible for everything but not themselves. Learning to take responsibility promotes evolution. In the present curriculum, suitable techniques are introduced to facilitate better educational results which are described below.

## 2.2 *Experimental design*

The research was designed in two parts: first the creation of the EE program on EIFU, and second the design of an experiment to gauge the level of environmental awareness in the students at the beginning and again at the end of the EE program. This experiment consisted of three questionnaires given to the students of the School of F&NE.

The first questionnaire was given to 100 forestry school students (FRS) before the workshops and featured a set of preliminary questions. That would help us create a 'profile' of the FRS regarding their pre-existing level of environmental consciousness. The rest of this questionnaire included questions that would gauge all facets of environmental consciousness in the students and would also serve as confirmation of the profile we created based on the preliminary questions. Since Forestry is an environmental science and as such its students are exposed to the concept of sustainability and ecology, we decided to administer the same questionnaire to a random sample of 88 students of other university school (OSS) (as a control group) to assess the pre-existing levels of environmental consciousness within the university and therefore the applicability of our program in a general educational setting (Aristotle is the largest university in Greece).

The second questionnaire was given only to the FRS at the end of their 'class environment' weekly workshops, to assess any change in their level of environmental consciousness. At the end of the workshop, teams were created (8–10 people each on average), and were asked to implement the reflective SWAN method (described below), a team project which they presented after a 3-day field practice at the university forest (mountains of central Pindus). At the end of this practice, the students were given a final (3rd) questionnaire about their project which concerned teamwork, asking students to express obstacles faced by their team and propose solutions.

Finally, we systematised the answers to our questionnaires according to these educational outcomes:

- a knowledge
- b awareness
- c skills
- d attitudes
- e intentions
- f behaviour
- g enjoyment

defined by Stern et al. (2014). We also gathered qualitative data in the form of interview questions about the program aspects that led to self-perceived changes in students' knowledge, attitudes and behaviours, to support the significance of particular educational practices (Ardoin et al., 2018).

## 2.3 *Knowledge, awareness and experience-based educational methods*

EE requires specific methods due to its difficult objective: understanding and teaching complex environmental issues in their entirety, integrating the traditional monodisciplinary education into maximum interdisciplinary training. That means

building a connection between affective and cognitive nature with tools that include both solutions and opportunities for the students (Bergman, 2016; Petegem et al., 2007; Devuyt and Hens, 1990). Groupwork gives a more stimulating ‘active learning’ environment, steering students away from the higher education culture of teacher dependence. ‘Student research teams’ are considered among the most advanced educational tools by Devuyt and Hens (1990). Participating in an event they organised themselves, gives students a sense of safety and belonging to a community and the environment (Steg et al., 2014). It is not enough to follow a good educational curriculum or teach about positivity and optimism but use the suitable tools to help the students experience these values. Deep experiences provide non-reversible outcomes. Powerful, ever-lasting techniques may offer the chance for transformation and rise of environmental consciousness to those who are willing to apply them.

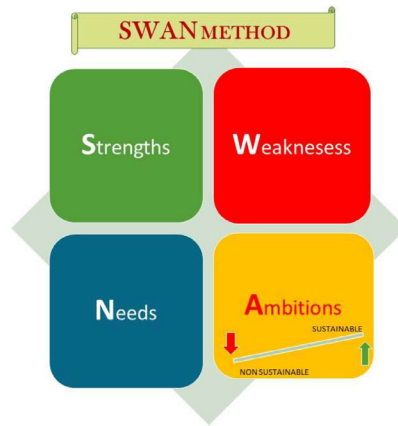
During their yearly month-long field practice, students had the opportunity to live in a forest environment and experience both indoor and outdoor education. They participated in experiential workshops, based on the SWAN and Pratipaksha Bhavana method. The aim was to train students to lead scientific workshops, collect and process information, transform it into knowledge and reach conclusions supported by data which they were finally asked to present to their peers.

### *2.3.1 SWAN method*

SWAN is a method created by Niranjanananda (1999). It is an acronym that stands for strengths (positive personality traits, skills, talents), weaknesses (qualities that prevent positivity from manifesting itself), ambitions (drive, motivation aspiration) and needs (basic life requirements like water, shelter, satisfaction, purpose, balance with nature) (Ratnashakti, 2018). During their field exercise, each student was, as a first step, asked to formulate their personal SWAN and then the SWAN of the natural environment (Figure 2). As foresters-environmentalists it is vitally important first to know the strengths of ecosystems relative to the fulfilment of our essential needs and the Weaknesses, including threats and limitations to their successful management. The second step is identifying the ambitions and needs and differentiating between them as well as between ‘sustainable’ and non-sustainable ambitions. These ambitions and needs ideally, ‘naturally’, ‘normally’ are aligned.

To develop awareness of what one is doing, one needs to identify one’s weaknesses, what triggers negativity within and what upsets one’s balance, before they can be worked on. Discovering our basic needs, what is lacking in a situation to make life more harmonious, becomes a priority: first comes recognition and then self-transformation. This approach requires relaxation, self-reflection and the willpower to change. Awareness implies that one knows what has to change, how to proceed, and use past experiences to transform a particular condition or situation. Willpower means maintaining conviction, adhering to the right and proper context. These components help one evolve their values and qualities (Niranjanananda, 2018, 2013a).

So alongside the external goal of sustainable management of natural ecosystems, we need an internal goal of sustainable team management to promote cooperation, altruism and ethical behaviour in general, for which the Pratipaksha Bhavana method was introduced.

**Figure 2** The SWAN method (see online version for colours)

### 2.3.2 *Pratipaksha Bhavana method*

Pratipaksha Bhavana is a practice outlined in the ancient Yoga Sutras that means anything negative should be converted into something positive (pratipaksha means ‘opposite’ and bhavana means ‘cultivation’ in Sanskrit) (Sivananda, 1946). It suggests that students focus on developing strengths, such as empathy – the capacity to experience the feelings of others – instead of fighting problems, such as aggression and poor emotion regulation. This method can be applied in the way we approach the environment (Figure 3). Participation, cooperation, and building capacity of all the stakeholders are the factors needed for a successful environmental sustainable development (Glavič, 2020).

This educational tool strengthens the willpower to let go of negative and depressive states which hampers students’ happiness and creativity, and helps build the courage and strength to replace them with positive, happy memories, ideas and visions, neutralising the mind’s reaction. So this method is not about removing the negative, but calmly observing without fighting it, and cultivating and focusing on the positive (Niranjanananda, 2018, 2013b).

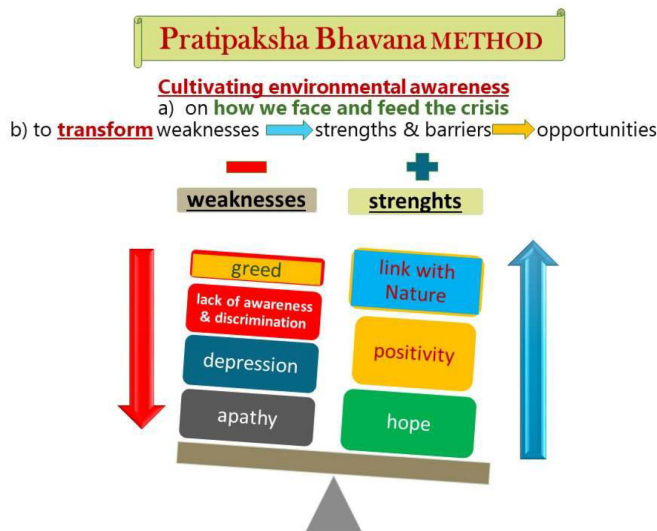
As the third step of SWAN method, Pratipaksha Bhavana was introduced to transform weaknesses into strengths and barriers into opportunities. Greed, a significant factor in environmental degradation, can be reduced through contentment and human connection, which will prove crucial in the students’ future as managers, scientists, cooperators in groups and ultimately for the ecosystems.

Repetition is essential to reprogramming. Cells which are stimulated together interconnect (law of Hebb). By replacing negative thoughts and emotions with positive ones, the negative flow of thoughts and emotions halts and reprogramming begins, limiting the effect of negativity on the person. There is no limit to the therapeutic and creative power of the human mind. If we accept this, a mental state of unhindered imagination starts changing the mind in order to establish new ideas. In the Pratipaksha Bhavana method the steps towards developing understanding not through consumption of information but through transforming it into attitude and action, according to Sivamurti (2013), are:

- 1 Gaining awareness of negative emotions and thoughts and creating an environment where students can observe them. Simply becoming aware is enough for them to start transforming a negative situation.
- 2 Accepting that negative patterns of thinking – feeling – reacting need change.
- 3 Realising such thoughts, emotions, behaviours and reactions disturb their peace of mind and taking responsibility for them.
- 4 Understanding those mental experiences can be replaced with positive ones.
- 5 Looking for ways and strategies to replace them with an opposite thought, emotion, behaviour, reaction.

An effort was made to apply (introduced to the students in brief) these steps to Forestry students, despite the limited available time, space and provisions.

**Figure 3** The Pratipaksha Bhavana method (see online version for colours)



### 3 Results

The results of our research are presented in the tables that follow. Table 1 shows the results of the preliminary questions that were given to the FRS before the commencement of the EIFU course. These questions helped us form a 'profile' for the FRS students regarding their level of environmental awareness before the EIFU course. Table 2 shows the students' own suggestions on the university curriculum in general, also obtained at the beginning of the EIFU course.

**Table 1** Additional preface questionnaire only for students of the School of Forestry

<i>Preface questions</i>	<i>Yes</i>	<i>No</i>
Was School of Forestry (SF) your first choice of interest?	16%	84%
Do you believe that SF can or could possibly meet your interests?	86%	14%
Do you think you can find employment through forestry?	41%	59% sceptical
Do you think consumer consciousness is related to forest utilisation?	Very much: 84%	Less: 16%
Do you think that your current state of knowledge of the natural environment influences your way of thinking and consumption habits?	81%	19%
Do you think that your role as forester-environmentalist is important for environmental sensitisation of people?	76%	24%
A subject, connected with this cultivation of environmental consciousness, has to be compulsory in the curriculum	81%	19%
What is the primary goal of environmental education? (multiple answers)		
a cultivation of environmental consciousness	70%	
b knowledge of the environment	47%	
c other-please define	2%	
How great do you believe your contribution is in solving problems of forestry and degradation of natural environment		
a very limited contribution	43%	
b moderate contribution	48%	
c great contribution	8%	
d no answer	1%	
The cause of your motivation and interest in natural environment (N.E.) is		
a the consideration of N.E. as part of yourself	63%	
b fear of the consequences of non-sustainable development	33%	
c other	4%	

Table 3 includes all the questions given both to FRS (before and after the EIFU course) and OSS students, and shows how we categorise each according six categories: 14 questions related to knowledge, 21 to awareness, 17 to attitudes, 12 to intentions, nine to behaviour and two to skills. Of these, nine questions refer to positive educational outcomes and in five of them the results between different groups did not differ.



**Table 2** Forestry student suggestions on the university curriculum

---

- Obligatory lessons that cultivate environmental consciousness. More environmental education, and courses on protection of the natural environment and human behaviour lessons.
- Some courses aim only to complete the curriculum. There should be more emphasis on information on the environment in general.
- More sociological courses to understand the artificial needs of humans which lead to overspending.
- More real examples of interactions in nature.
- More actions and team activities. Volunteering is important.
- Emphasis on environmental matters, not so much on academic knowledge.
- More interactive courses on the protection of the natural environment, in relation to the main subject of our studies which is sustainability.
- Apart from basic knowledge and protection, we only focus on human needs and production. We could have internships cooperating with environmental organisations, since many of them offer work positions to foresters. In addition, all courses that focus on environmental views are optional, not mandatory.
- We should discuss in depth the problems of the natural environment and possible solutions to raise the awareness of students. Students should be informed on the actual and difficult situations they are going to encounter and the effect of man in nature.
- The fulfilment of human needs is not above the protection of the planet. Man disturbs natural balance by trying to be in charge. It is like telling you that for one day, you'll be the brain of your body. Unless you're a perfectly trained doctor, you will forget something among all these systems, maybe a hormone. That's how the planet is. It needs cooperation and proper education, to solve problems.

---

**Table 3** Educational outcomes related to student answers

---

<i>Questions and their coding criteria</i>	<i>Educational outcomes</i>						<i>Positive ed. outcome</i>
	<i>Knowledge</i>	<i>Awareness</i>	<i>Attitude</i>	<i>Intention</i>	<i>Behaviour</i>	<i>Skills</i>	
1 To what extend do you believe that purchasing habits affect the natural environment?	1	1					
2 To what extend do environmental problems occupy you on a daily basis, and affect your way of thinking and your daily life?		1	1		1		
3 To what extend do you feel responsible for the state of the natural environment in your country?	1	1					
4 To what extend do you feel that 'others' are responsible for the state of the natural environment in your country?	1	1	1				

---

Note: \*Same indicates equal results between control group and group received environmental education.

**Table 3** Educational outcomes related to student answers (continued)

<i>Questions and their coding criteria</i>	<i>Educational outcomes</i>						<i>Positive ed. outcome</i>
	<i>Knowledge</i>	<i>Awareness</i>	<i>Attitude</i>	<i>Intention</i>	<i>Behaviour</i>	<i>Skills</i>	
5 Do you feel inspired by the idea of cooperating for a common cause?	1		1	1			Same*
6 To what extend do you believe that ethics should relate to the use of natural resources?	1	1	1				
7 To what extend do your academic studies provide education on ethical matters?	1	1					
8 Do you think that society can overcome the financial crisis regardless of the state of the natural environment?			1				
9 Do you believe sustainable (future viable) development can exist while ignoring the natural environment?	1	1					
10 Do you believe there should be untouched ecosystems on the planet?	1	1					
11 Would you participate in volunteering activities of environmental protection?			1	1	1		32% active
12 In which activities of protecting the natural environment would you participate in?			1	1	1		same
13 Do you perceive the natural environment to be something external and unrelated to you, or a part of yourself?	1		1				+
14 How do you perceive the statement 'my homeland'?		1	1		1		same
15 Do you think nature is mainly...	1	1	1				+
16 In which way do you believe you can contribute more efficiently to the solution of environmental problems?			1	1	1		same
17 The resolution of environmental problems may begin by...		1					same
18 Developing environmental consciousness is mainly related to...		1		1			same
19 To what extend do you think that the state of the natural environment is related to financial development?	1	1					

Note: \*Same indicates equal results between control group and group received environmental education.

**Table 3** Educational outcomes related to student answers (continued)

<i>Questions and their coding criteria</i>	<i>Educational outcomes</i>						<i>Positive ed. outcome</i>
	<i>Knowledge</i>	<i>Awareness</i>	<i>Attitude</i>	<i>Intention</i>	<i>Behaviour</i>	<i>Skills</i>	
20 To what extend do you think your cultivation of environmental consciousness is going to help you in practicing your professional duties?			1	1	1		+
21 To what extend do you think the cultivation of your environmental consciousness is going to help you in finding a job, related to your occupation?			1	1	1		+
22 To what extend do you believe that the interactions and interrelationships that define nature are related to your life?	1	1					+
23 To what extend do you think that ethical attitudes and behaviours may contribute to overcoming the crisis?		1	1	1			+
24 Which do you think is the greatest environmental problem for our planet today?	1	1					
25 Your knowledge regarding the environmental problems of the planet, mostly make you feel...		1	1	1			+
26 Which do you think to be the greatest problem in cooperating and teamwork?		1	1	1	1		+
27 Did the personal SWAN project help you in fulfilling the team project?		1	1	1		1	+
28 Which problems occurred regarding the fulfilment of the team project SWAN that you undertook, and in which ways do you think they can be resolved?	1	1	1	1	1	1	same
	14	21	17	12	9	2	

Note: \*Same indicates equal results between control group and group received environmental education.

Tables 4, 5, 6 show the results (%) of the questionnaires given before (T4), before and after (T5) and only after (T6) the courses. M.E.C. stands for 'more environmental consciousness' which is a relative indication of measuring the outcomes.

**Table 4** Questionnaire results in % before the courses

<i>Question</i>	<i>FRS (%) Forestry students</i>	<i>OSS (%) Other school students</i>	<i>Questions in brief</i>
Q1	97 M.E.C.	95	Consumer habits
Q2	51	79 (+28%) M.E.C.	Daily thought about the environment (E.)
Q3	76	87 (+11%) M.E.C.	Feel responsible about the E.
Q4	96 (+11%) M.E.C.	85	Believe others are responsible
Q5	85	84	Inspired by the idea of cooperation
Q6	97 (+15%) M.E.C.	82	Ethics are related to utilisation
Q7	10 (+4%) M.E.C.	6	Adequate educational curriculum
	49	51	Inadequate educational curriculum
Q8	84 (+36%) M.E.C.	48	Society cannot overcome crisis without considering the environment
Q9	92 (+15%) M.E.C.	77	Sustainable development
Q10	85 (+19%) M.E.C.	66	Belief in untouched ecosystems
Q11	56	88 (+32%) M.E.C.	Show intention to participate in actions
	32	-	Intention became action
Q12	65	69	Inspired by environmental actions
	61	59	Inspired by environmental knowledge
Q13	63	80 (+17%) M.E.C.	E. as part of themselves
Q14	42	48 (+6%) M.E.C.	Home place of which they are responsible
	30 (+5%) M.E.C.	25	Planet earth
Q16	84	94 (+10%) M.E.C.	contribution to environmental solutions by changing consumer habits
Q17	76	80 (+4%) M.E.C.	Cultivation of environmental consciousness
Q18	Given after the course	culmination	
Q19	93 (+14%) M.E.C.	79	
Q20	Given after the course	culmination	
Q21			
Q22			
Q23	80 (+7%) M.E.C.	73	Contribution of ethics in overcoming the crisis. Very much and enough
	29	33 (+4%) M.E.C.	Very much

Note: M.E.C. – more environmental consciousness.

**Table 5** Questionnaire results in % before and after the courses – including project

	<i>Before courses</i>		<i>After courses</i>	<i>Answers in brief</i>
	<i>FRS (%) forestry students</i>	<i>OSS (%) other school students</i>	<i>FRS (%) after end of project</i>	
Q13	63	80 (+17%) M.E.C.	85 (+22%)	Experience nature as part of themselves
Q23	80 M.E.C. 29 (very much)	73 (-7%)	39 (very much) (+10%)	Contribution of ethics in overcoming the crisis.
Q24	42	13 (-29%)	14 (-28%)	Pollution, no. 1 environmental problem
	12	33	43 (+31%) M.E.C.	All problems equally important
	6	22	23 (+17%)	Environmental problems are caused by the lack of environmental consciousness
Q26				Biggest barrier for cooperation is
	24	28 (+4%) M.E.C.	15 (-9%)	a indifference for the subject
	23	13 (-8%)	35 (+12%)	b indifference for team work
	24	13 (-11%)	17 (-7%)	c lack of knowledge
	9	19 (+10%)	10 (+1%)	d lack of respect

**Table 6** Questionnaire results in % after the courses

	<i>FRS (%) forestry students</i>	<i>OSS (%) other school students</i>	<i>Answers in brief</i>
Q15	57 (+26%) MEC	31	Nature is above all “the intelligent force who can sustain, heal herself and people and take care of their needs when people respect it”
Q18	41	43	Students associated the cultivation of environmental consciousness with the cultivation of character qualities that reflect of the way of thinking, behaving and living.
	39	34 (-5%)	This cultivation is fundamentally related to the cultivation of respect for the natural environment.
Q20	72	49 (-23%)	Positive answer is irrelevant to the future profession
Q21	38	18 (-20%)	Environmental consciousness will help them a lot to find a job relevant to their scientific field.
Q22	86 MEC	78 (-8%)	Interconnectivity in nature is highly related to their lives

**Table 6** Questionnaire results in % after the courses (continued)

	<i>FRS (%) forestry students</i>	<i>OSS (%) other school students</i>	<i>Answers in brief</i>
Q25 (about feelings)	58	39 (-19%)	Need for action
	30	17 (-13%)	Feel persuaded to contribute in finding solutions
	88	56 (-32%)	In total students report constructive feelings
	50	40 (-10%)	Feel worried
	89	86	Experience negative feelings in relation to environmental degradation. Anger and fear are considered as both negative and positive feelings. Their direction depends on education and mind management. For the time being we considered anger, fear, feeling of helplessness and worry as negative feelings.
Q27	66%		Positive personal SWAN contribution
	22%		Not involved themselves in personal SWAN practice

### 3.1 *Students' environmental consciousness profile*

Students know that sustainability is the main theme of their studies. They indicate that their role as foresters requires them to understand not only the purely academic aspects of environmental studies but also the social and ethical. Regarding the students' environmental consciousness profile, a short (detailed in the tables) questionnaire results comparison follows:

- Q8: 84% of FRS and 48% of OSS (-36%) reported that a society cannot overcome a crisis without considering and improving the condition of natural environment and 14% of OSS had no opinion compared to 6% of FRS (-8%).
- Q9: 8% of FRS and 23% (15%+) of OSS reported there can be sustainable development regardless the condition of natural environment.
- Q6: 97% of FRS and 82% of OSS (15% less than FRS) believe ethics are strongly related to utilisation of natural resources.
- Q17: 76% of FRS and 80% of OSS (+4%) consider the cultivation of environmental consciousness as number one priority in order to start solving environmental problems.
- Q20: 72% of FRS and 49% of OSS (-23%) believe the cultivation of environmental consciousness will help them a lot in their professional career (no matter what this profession might be).

- Q21: 38% of FRS and 18% of OSS (-20%) believe having this environmental consciousness will help them find a job relevant to their science field. 36% of FRS and 30% of OSS (-6%) believe this might happen in a moderate degree.

Of particular importance are the answers to the question: ‘which do you think to be the greatest obstacle in teamwork for the fulfilment of the group project?’ (Table 5, Q.26). 24% of FRS and 28% of OSS (+4%) selected the indifference for the educational subject, whereas 23% of FRS (+10%) and 13% of OSS answered: ‘the indifference for team work’. 11% of OSS hadn’t, as of the time they were asked, the chance to participate in team work so they gave no answer. 24% of FRS and 13% of OSS (-11%) consider ‘the lack of knowledge’ as the major problem and 9% of FRS and 19% of OSS (+10%) consider the same for the ‘lack of respect’. This question was asked again of the FRS students during their field exercise, at the end of the group project they participated it (82 participants), and while living together in a forest environment.

A comparison of all the respective answers compared to the 88 answers given prior to this project, showed a decline (-9%) in the choice: ‘indifference towards the educational subject’ as the biggest barrier for cooperation. Those considering the lack of knowledge as the major problem reduced by 7%. The choice ‘the indifference of others for team work’ as the major problem in creased by 12%.

Table 7 refers to student application of SWAN method, while Table 8 shows their comments on possible solutions and project evaluation.

**Table 7** (Related to Q28) Student report of problems they had faced during SWAN project and how they overcome or could possibly overcome them

<i>Barriers, problem identification (-)</i>	<i>(+) Opportunities, positive transformation</i>
Difficulty and unwillingness to cooperate	See problems as opportunities
Unequal work distribution	Acceptance, unity and cultivation of self-knowledge
Lack of respect	Opportunity for teamwork and cooperation with others, especially with new people, that they wouldn’t meet otherwise.
Indifference	Giving time to others.
Shyness – that also leads to indifference	Developing imagination, creativity
Fear of failure	Reason for developing new perspectives
Difficulty and fear of expressing personal views	Changes in the way of thinking
Inadequacy in team presentation	Food for thought
Lack of time, sloppiness	Chance for learning time management
Repetition of the same views	
Lack of originality	
Lack of experience related to the project	
Ignorance	

**Table 8** Student comments and suggestions on possible solutions and project evaluation

---

“Valuable experience, such as friendship.”

“Realizing the potential and the desire for improvement and overcoming limitations.”

“Those who are shy overcome this barrier by encouragement to present their work.”

“The empowerment of team projects and other kinds of cooperation. The project appeared strange and meaningless in the beginning but proved very effective in giving knowledge, awareness, experiences and brought us closer to reality. Discussion on voluntary work proved very helpful and could contribute to the creation of such teams. The project helped us realize the source of each problem and provided the way to transform the problems into opportunities for the benefit of all.”

“We came face to face with our fear of failure regarding the team presentation and were encouraged to have a healthy cooperation.”

“Very interesting experience to function as a team. We realized we can give more chances to ourselves and others to interact, because together we can do more. It gave us hope and desire to be more active. We were moved by the way others spoke and converted problems into solutions. It increased our respect for each other and we realized how lucky we are for the opportunity. We hope the school of forestry help students graduate as sensitized professionals with environmental consciousness. The nature of SWAN project proved very helpful to find weaknesses step by step and to express ideas on how to convert them into opportunities.”

“The motive of converting barriers into opportunities gave us extra motive on further applying SWAN.”

“The project helped like no other educational means to overcome the general fear of self-expression which normally students have. More such projects must be organized for the benefit of all. It is food for thought, and an opportunity to learn about ourselves and about such an important subject. It is an opportunity to overcome our limitations and receive courage for the future. For the first time we had the chance to speak in front of others.”

“We are satisfied with team work. For the first time we worked together and results surprised us.”

“The project promotes communication, cooperation and self-awareness. We should work on such projects regularly.”

---

The results of this research indicate that environmental consciousness in our university is not adequately cultivated, despite the students considering it the primary objective of their EE. Students also associated environmental consciousness with the development of character traits which affect the way of thinking, acting and living in general. More than 1/3 of all groups reported this character fundamentally relates to the cultivation of respect for the natural environment. Additionally, they stated that their university studies do not provide them with adequate education in matters of morality, which they consider a prerequisite to overcome the multifaceted crisis humanity is facing.

Our research has shown that students understand the problem, recognise the value and meaning of having environmental morality, but face difficulties in group action. They were consequently asked to identify the problems they faced and mention ways of overcoming them using the aforementioned methods they were taught.



- Q11: 56% of FRS and 88% of OSS (32%+) reported their intention to participate in voluntary actions for environmental protection. 42% of FSS expressed willingness for participation but under conditions. Finally, out of this 56%, only the 32% have actually participated in an action voluntary project.

The same incentives and opportunities were given to both groups of students (2018, 2019). Only one of them created an environmental action group and that can perhaps be attributed to the instructor explicitly urging them to do so. There is however in our findings evidence that another factor came into play: the students of the second group (2019) (Figure 5), named the lack of mutuality, respect and empathy as the greatest obstacles to team work. This result points to a deeper issue that emerges from the social culture the students develop in. The relentless competition in the job market and the equally – if not more – destructive competition on the individual level through social media has greatly reduced the ability of students to trust and depend on one another. In this culture of callousness the personal and social objectives of education have shifted towards financial success, domination of peers and mental isolation. It is perhaps considered a disadvantage to have the same values, ideas or goals as other students competing for future job security.

During the same semester, a task was given to the second group (2019) to which they didn't respond. At a particular point of the program, in a class environment, studying the subject of sustainability in action, deforestation and palm oil, students wondered about their future prospects that would be suitable, and posed relevant questions to their educator. Thus, ways of conscious consumption were proposed to them and they had the option – with the educators' help – to write a letter to the states' chocolate-biscuit industries. In this letter they could clarify their intention of keeping on buying the products but under the condition of getting a 'palm oil free' option. Although the educator encouraged them to write this letter, there was no response and no follow up. In the relationship between the educator and the students, inspiration is the motivating force, the fuel, which starts flowing from the educator, but feedback is a two-way relationship.

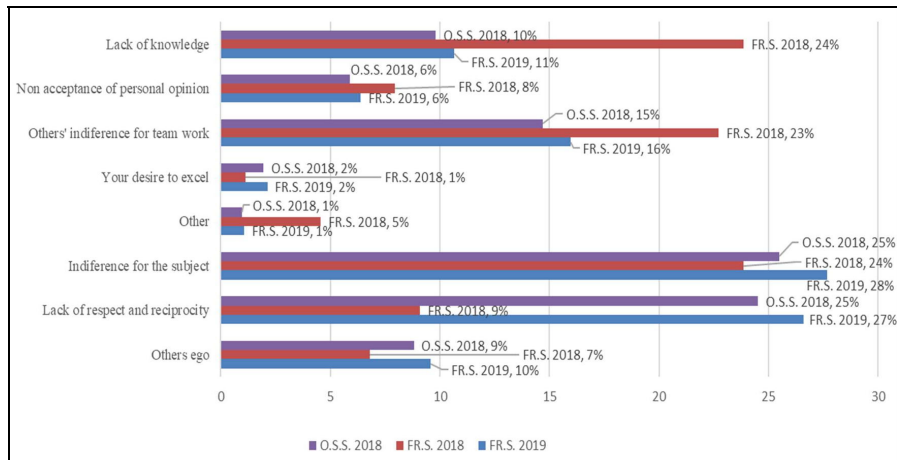
A few months later, during the forest training period, the same group presented to their peers concerning their work on 'palm oil and sustainability group project' and show interesting interactions, including their ability to cooperate. It became obvious that daily, they gave much thought on their consumption habits and according to most of them, they were now searching and thinking before buying, reading the product labels in particular. But still, so far, these positive changes didn't take the form of commitment towards collective actions and thus, only the 1st group (the previous year' students-2018) engaged themselves in environmental actions.

By far the most important result of this effort is this: after completing their educational obligations, 1/3 of the students (32 out of 100) (37 in total including younger or older students who wished to join in), asked to continue the project in the form of an active group of volunteers. Since then, the inspired team has been meeting on a week-basis to plan, organise, take action for fire protection, forest recreation, and water management in collaboration with the National Forest Service (Figure 4).

**Figure 4** Members of the team in action (see online version for colours)



**Figure 5** Which do you consider the greatest barrier to collaboration and group work? (see online version for colours)



## 4 Discussion

### 4.1 Cultivating awareness

Our study tried to illustrate the connection between awareness cultivation and deep understanding. EE tools for the cultivation of environmental awareness proved to be the essential for the integration of EE and social change (Petegem et al., 2007). The reason for this, as suggested by Steg et al. (2014) and Wi and Chang (2018), is that deep understanding and awareness for the environment and the benefits and implications of action inspired by them, is a necessary precondition for an effective EE. In our study, the fact that 1/3 of students took action and many of them are still active shows that a seed of awareness planted in them and is still growing in the form of care, responsibility and understanding. Moreover, it highlights that when knowledge gradually transforms into empirical (Wang et al., 2004) understanding of the interactions and interdependent relationships within nature, it becomes a way of life. Only then can the roots of environmental problems be effectively dealt with, a fact that was reflected in the students' attitude towards the holistic educational approach to these problems.

### 4.2 Raising consciousness

The term 'raising environmental consciousness' is a complex construct involving transforming people in deep multidimensional ways rather than just encouraging shallow talk or basic awareness about environmental matters. In consensus-based best practices in EE according to review conducted by Stern et al. (2014), authors question: 'are programs failing to target behavioural outcomes?'. There is an ongoing effort to understand not only if EE works, but also how and why it works and also broaden the suite of outcomes typically measured and explore new ways of empirically measuring behavioural change. To change this, EE must be holistic, instead of encouraging students to act in a technical-rational manner according to prescribed guidelines. This, according to Nazir

and Pedretti (2016), entails ethics of care, connecting people to their environment encouraging compassionate care for it, facilitating awareness and understanding of the holistic, interrelated nature of the world, experiential and transformative learning, deeply engaging experiences.

Connecting refers to the formation of a personal, tangible, multidimensional bond with nature (in our case, with specific ecosystems) in order to develop feelings of care and respect for nature and learn to love the Earth as a broadened sense of self (Fien, 2003). In our study, the emotional connections made during the educational programs were the primary drivers of the measured outcomes. The predominant answer to the question: how do you understand the phrase ‘my home place’, was by 42% ‘the place they feel responsible for protection and by 26% ‘planet earth’, proving that emotional attachment to place is necessary for students to experience environmental problems as part of their daily lives and work with and for the environment. Active engagement in the real-world through a multidisciplinary approach, leads students to identify appropriate courses of action (Hungerford and Volk, 1990; Hungerford et al., 2000, 2001). In our case the student’s first action was an investigation project (cooperative group work) focused in real-world engagement with nature. This included explicit attempts for connecting the program’s content to participants’ home lives, and social engagement.

Care-based theories maintain that educating emotions is as necessary as educating the mind and a necessary precursor, upon which rationality is built (Nazir and Pedretti, 2016). Participants’ development of emotional connections may be just as important as other claims but are rarely systematically measured (Ardoin et al., 2018). Moral behaviour based on care through empathy and responsibility to the natural world is one of the fundamental ideas of EE. To empower students to care not only for the environment but also for one another, learning should arise from emotion and spirit. Thus educators need to exhibit both rationality and passion for the subject matter (Nazir and Pedretti, 2016). In our case, this was put to action through role models. At least two foresters gave presentations to the students during workshops and their positive response is evident in their feedback. Recognition of positive qualities in others can encourage people to cultivate them in themselves.

Connecting requires nurturing a holistic relationship with the self and the world. In EE, distinctions between knowledge and moral/value issues cannot be made, knowledge is strongly associated with the setting within which it occurs (Malandrakis, 2006). Thought and emotion are closely linked through neural pathways, between the sensory thalamus and the amygdala – the emotional centre of the brain – but also to the sensory cortex, where reasoning activities take place. Thus, concepts, feelings and behaviours are all interconnected and are involved in the formation of attitudes and beliefs, and in constructing value systems that underpin environmental relationships. For Littledyke (2008), the integration of the rational and emotional with socially or ecologically beneficial behaviour has particular relevance to fostering reflective awareness.

Holism expresses the idea that the world is a seamless, dynamic, interconnected whole of which we humans are a part, and it is the basic concept of yoga (means unity). As Jung (<https://www.mainejungcenter.org/about-us/mission-statement/>) described: “at times I feel as if I am spread out over the landscape and inside things, and am myself living in every tree, in the splashing of the waves, in the clouds and the animals that come and go, in the procession of the seasons”. Ecology means respecting, understanding and living in accordance with the laws of nature to which Yoga contributes by emphasising the interdependence and unity of all nature. Its principles therefore can help us

understand our role in the environment and of the elements we are composed of and to respect and live according to natural laws. To understand nature we have to rise above duality, to be able to expand the awareness, understand the oneness of ourselves with creation and there is no science other than yoga that can give us that knowledge in such a perfect and systematic way (Satyasangananda, 2013).

Holism accepts that humans are multidimensional beings with physical, mental, emotional and spiritual aspects and that education needs to engage. By educating the whole person, holistic education brings students (who often see themselves as fragmented) to a balanced, connected and inclusive relationship with the world– what is referred to as educating the head, heart and hands (Sivananda, 1946), in other words, the mind and emotions (Higgins and Nicol, 2011) and actions. Liefländer et al. (2013) noted that sustainability is contingent upon individuals believing they are a part of nature. The fundamental issue of our time is that human-Earth relations and human belonging to the greater biotic community needs not only be understood but also experienced through EE in order to lead to action, a key outcome of EE (Beery, 2013). Holistic experiences bring the relevance of the educational activity coherent and provide a clear take-home point for students to reflect upon and pursue (Skibins et al., 2012). For Karpan et al. (2020), cumulative result of environmental education is formation of environmental culture, and in this context, it is better to overlook environmental education and culture as a mechanism of formation of spirituality of sustainable development with principles of environmental ethics forming its' foundation.

Raising environmental consciousness through education also requires providing people with deeply engaging experiences causing a structural shift in the basic premises of thought, feelings, and actions, that dramatically and irreversibly alters our way of being in the world, what is called 'transformative learning' (O'Sullivan, 2003). EE should focus on transforming people in such ways that support the long-term sustainable well-being of the Earth (Kolb, 1984; Bowers, 2009; Kahn, 2008; Wals and Dillon, 2013; Nazir and Pedretti, 2016; Ronen and Kerret, 2020; Finnveden et al., 2020). Raising environmental consciousness is really about 'turning ecological ethics into life practice', into habits of mind, body and heart (Bai and Romanycia, 2013).

All of these principles were implemented in our study – connecting people to their environment encouraging compassionate care for it, holistic education, and experiential, transformative learning. This happened through the cultivation of awareness of thoughts, emotions and behaviour, both individually and as team members. Furthermore, with applied methods (SWAN and Pratipaksha Bhavana), students slowly learned to focus on developing positivity and seeing problems as opportunities. Emphasis was put on collective – team work and students were encouraged to more fully develop as individuals by improving as group members.

Providing area-specific, local, hands-on experience is very important in helping students develop competence, critical thinking and actually commit. (Petegem et al., 2007). Students were encouraged but not given specific instructions so as to choose the types of activities and locations themselves. The first location was at a university forest of Mt. Holomondas (Northern Greece) in which they created a pathway, and a view spot for recreational purposes. Moreover, they decided to face eroded patches of earth as an opportunity to create and restore.

The second location was in the forest near the university campus. In this case they were engaged in forest fire protection by clearing a firebreak around a recreational area. These concrete experiences of collaboration with local authorities, bridge thought and

practice in a benign way, guiding students in their transition from wanting to help the environment, to feeling empowered to do so. These truly engaging experiences of environmental learning are framed within a space of hope rather than despair scenarios that can leave students feeling hopeless and helpless. Instead, they created the conditions for transforming the students by providing opportunities for them to connect and care for others (human and non-human), within their environments.

### *4.3 Future research*

While EE has long been defined through the prism of knowledge, its goals typically aim to affect the behaviours of participants (Hungerford and Volk, 1990; UNESCO, 1978). In most studies, knowledge is the most commonly measured outcome based solely on the quantitative approach (Dimopoulos et al., 2008). These authors though suggest the combination of qualitative and quantitative evaluation for complementary outcomes so future research can paint the whole picture of students' emotional and cognitive world; Questionnaires should be further tested to improve their capacity to record the knowledge, understanding and attitudes of students.

Ronen and Kerret (2020) proposed ten rules for implementing sustainable wellbeing literacy to help school programs illustrate the interconnections between individual wellbeing and the wellbeing of the natural environment:

- 1 focus on behaviour
- 2 focus on solutions
- 3 be flexible
- 4 think and direct behaviour to the future
- 5 act in small steps
- 6 think and feel positive
- 7 identify and use individual strengths
- 8 together and integrative
- 9 find resources
- 10 look at policy and policy makers

They urged schools to focus on behaviour (actions) and solutions, to think and feel positive, to identify and use individual strengths and encourage collective actions. These rules could have served as categories in our questionnaire design, but our research was completed before the publication of this study. Still, we were well aware of all of them and planned the educational program according to these lines.

Nazir and Pedretti's (2016) survey of EE literature found little rigorous evidence of multidimensional learning or practical application of ethics of care in EE, particularly when so many evaluations of practice focus on knowledge, attitudes and behaviours. According to these authors, "when this is coupled with the overwhelming body of evidence supportive of focusing on the cognitive basis of learning, resistance to notions of EE as consciousness raising become understandable. The challenge then for advocates of this interpretation of EE, is to continue arguing in a more compelling way for the

efficacies of alternative modes of learning” (Nazir and Pedretti, 2016). For Tal (2010), more than other fields, EE requires a greater employment of transformative methods that encourage the learners to develop and adopt new forms of thinking and behaviour and it is often about relationships, processes, and providing opportunities for transformative experiences, rather than a singular focus on a specific outcome; as such, an outcome-oriented research design may distort perceptions of success, while missing the overall richness of experience. These authors support calls for broader perspectives on what is measured and, relatedly, alternative research approaches and methods.

#### *4.4 Limitations*

The research limitations are relevant to all the barriers analysed in the introduction section, plus the limited available time. Transformation needs time courage and will.

“To stop short in any research that bids fair to widen the gates of knowledge, to recoil from fear of difficulty or adverse criticism, is to bring reproach on science. There is nothing for the investigator to do but go straight on, ‘to explore up and down, inch by inch, with the taper his reason;’ to follow the light wherever it may lead, even should it at times resemble a will-o’-the-wisp”.  
(Sir William Crookes)

### **5 Conclusions**

Researchers and practitioners in the field of EE suggest shifting the focus away from cognitive knowledge about the environment and towards raising peoples’ environmental consciousness in deep and substantive ways. The delusion that personal financial success can protect an individual in the face of environmental destruction removes the incentive to collaborate with their peers and overcome differences.

An holistic education that brings students face to face with real world problems and equips them to deal with emotional and social pressures is the only way to cultivate environmental consciousness and cooperation within the current political, economic and environmental climate. This paper aimed to highlight the importance:

- of providing conditions of holistic transformative experiences for successful EE
- of raising environmental consciousness through cultivating awareness.

The case study took place within an educational program on EIFU for the undergraduate students of the university school School of Forestry and Natural Environment, Thessaloniki, Greece. Time lasting methods were presented and an effort made to apply them in order to succeed in EE programs.

Our research highlights the need for both self-education and team empowerment. This can be achieved by focusing on solutions rather than problems and to our positive common ground as human beings. Environmental sustainability is intimately connected with finding ways to build sustainable connections with nature and with each other.

We have to be prepared to fulfil EE goals like developing awareness and raising both self- and environmental consciousness to bring balance between actions, thoughts and emotions, breaking the divisions between human being and nature. Education is a process of self-transformation, as signified by experiential, transformation and care-based theorists and the ancient but always relevant science of yoga.

## Acknowledgements

We thank all the authors we are referring to for sharing their knowledge, and especially all the masters in the field of yoga for their inspiration. We also thank the students who eagerly participated in our research and without them it would not have been possible to complete it. Especially, thanks to the environmental group of students, the ‘Active Bees’, who are still working to raise environmental consciousness.

## References

- Ardoin, M.N., Bowers, W.A., Roth, N.W. and Holthuis, N. (2018) ‘Environmental education and K-12 student outcomes: a review and analysis of research’, *The Journal of Environmental Education*, Vol. 49, No. 1, pp.1–17, doi:10.1080/00958964.2017.1366155.
- Bai, H. and Romanycia, S. (2013) ‘Learning from hermit crabs, mycelia and banyan: schools as centers of critical inquiry and renormalization’, in Stevenson, R.B., Brody, M., Dillon, J. and Wals, A.E.J. (Eds.): *International Handbook of Research on Environmental Education*, pp.101–107, AERA Routledge, New York, ISBN 978-0-415-89238-4.
- Beery, T.H. (2013) ‘Nordic in nature: friluftsliv and environmental connectedness’, *Environmental Education Research*, Vol. 19, No. 1, pp.94–117, doi:10.1080/13504622.2012.688799.
- Bergman, B.G. (2016) ‘Assessing impacts of locally designed environmental education projects on students’ environmental attitudes, awareness, and intention to act’, *Environmental Education Research*, Vol. 22, No. 4, pp.480–503, doi:10.1080/13504622.2014.999225
- Bowers, C. (2009) ‘Educating for revitalization of the cultural commons’, *Canadian Journal of Environmental Education*, Vol. 14, No. 1, pp.196–200.
- Danezis, M. and Theodosiou, S. (2012) *This is the Way I See the World*, Diavlos publications, Athens.
- Devuyst, D. and Hens, L. (1990) ‘Integration of environmental education into general university teaching in Europe’, *Higher Education in Europe*, Vol. 15, No. 4, pp.15–23, doi: 10.1080/0379772900150403.
- Dimopoulos, D., Paraskevopoulos, S. and Pantis, J. (2008) ‘The cognitive and attitudinal effects of a conservation educational module on elementary school students’, *The Journal of Environmental Education*, Vol. 39, No. 3, pp.47–61, doi:10.3200/JOEE.39.3.47-61.
- Fien, J. (2003) ‘Learning to care: education and compassion’, *Australian Journal of Environmental Education*, Vol. 19, pp.1–13, doi:10.1017/S0814062600001427.
- Giroux, H.A. (2010) ‘Naked pedagogy and the curse of neoliberalism: Rethinking higher education as a practice of freedom’, in Giroux, H.A. and Witkowski, L. (Eds.): *Education and the Public Sphere*, Taylor & Francis online 11 June.
- Glavič, P. (2020) ‘Identifying key issues of education for sustainable development’, *Sustainability*, Vol. 12, p.6500, doi:10.3390/su12166500.
- Gödel, F.K. (1931) *On Formally Undecidable Propositions of Principia Mathematica and Related Systems* [online] [https://monoskop.org/images/9/93/Kurt\\_G%C3%B6del\\_On\\_Formally\\_Undecidable\\_Proposit\\_ions\\_of\\_Principia\\_Mathematica\\_and\\_Related\\_Systems\\_1992.pdf](https://monoskop.org/images/9/93/Kurt_G%C3%B6del_On_Formally_Undecidable_Proposit_ions_of_Principia_Mathematica_and_Related_Systems_1992.pdf).
- Finnveden, G., Friman, E., Mogren, A., Palmer, H., Sund, P., Carstedt, G., Lundberg, S., Robertsson, B., Rodhe, H. and Svärd, L. (2020) ‘Evaluation of integration of sustainable development in higher education in Sweden’, *International Journal of Sustainability in Higher Education*, Vol. 21, No. 4, pp.685–698, ISSN 1467-6370, Emerald Publishing, doi:10.1108/IJSHE-09-2019-0287.
- Higgins, P. and Nicol, R. (2011) ‘Sir Patrick Geddes, ‘Vivendodiscimus’ – by living we learn’, in Smith, T. and Knapp, C. (Eds.): *Sourcebook of Experiential Education: Key Thinkers and Their Contributions*, pp.32–40, Routledge, New York.



- Hornik, J., Cherian, J., Madansky, M. and Narayana, C. (1995) 'Determinants of recycling behaviour: a synthesis of research results', *Journal of Social Economics*, Vol. 24, No. 1, pp.105–27, GALE|A17103536.
- Hungerford, H., Bluhm, H., Volk, T. and Ramsey, J. (2001) *Essential Readings in Environmental Education*, 2nd ed., Stipes, Champaign, IL.
- Hungerford, H.R. and Volk, T.L. (1990) 'Changing learner behavior through environmental education', *Journal of Environmental Education*, Vol. 21, No. 3, pp.8–21, doi:10.1080/00958964.1990.10753743.
- Hungerford, H.R., Volk, T. and Ramsey, J. (2000) 'Instructional impacts of environmental education on citizenship behavior and academic achievement', Paper Presented at the 29th Annual Conference of the North American Association for Environmental Education, 17–21 October, South Padre Island, TX [online] <http://www.cisde.org/pages/researchfindingspage/researchpdfs/IEEIA%20-%2020%20Years%20of%20Researc.pdf>.
- Immink, M.A. (2007) *Three Principles of the Brain*, e-book [online] <http://www.integratemindbody.com>.
- Kahn, R. (2008) 'From education for sustainable development to ecopedagogy: sustaining capitalism to sustaining life?', *Green Theory and Praxis: The Journal of Ecopedagogy*, Vol. 4, No. 1, pp.1–14, doi:10.3903/gtp.2008.1.2.
- Karpan, I., Chernikova, N., Motuz, T., Bratanich, B. and Lysokolenko, T. (2020) 'Conceptual principles of education for sustainable development', *European Journal of Sustainable Development*, Vol. 9, No. 2, p.99, doi:10.14207/ejsd.2020.v9n2p99.
- Kolb, D.A. (1984) *Experiential Learning: Experience as a Source of Learning and Development*, Prentice Hall, Saddle River, NJ.
- Liefländer, A.K., Fröhlich, G., Bogner, F.X. and Schultz, P. (2013) 'Promoting connectedness with nature through environmental education', *Environmental Education Research*, Vol. 19, No. 3, pp.370–384, doi:10.1080/13504622.2012.697545.
- Littledyke, M. (1996) 'Science education for environmental awareness in a postmodern world', *Environmental Education Research*, Vol. 2, No. 2, pp.197–214, doi:10.1080/1350462960020206.
- Littledyke, M. (2008) 'Science education for environmental awareness: approaches to integrating cognitive and affective domains', *Environmental Education Research*, Vol. 14, No. 1, pp.1–17, doi: 10.1080/13504620701843301.
- Malandrakis, G. (2006) 'Learning pathways in environmental science education: the case of hazardous household items', *International Journal of Science Education*, Vol. 28, No. 14, pp.1627–1645, doi:10.1080/09500690600560738.
- Martínez-Borreguero, G.; Maestre-Jiménez, J., Mateos-Núñez, M. and Naranjo-Correa, F.L. (2020) 'Analysis of environmental awareness, emotions and level of self-efficacy of teachers in training within the framework of waste for the achievement of sustainable development', *Sustainability*, Vol. 12, p.2563, doi:10.3390/su12062563.
- Mezirow, J. (2000) *Learning as Transformation: Critical Perspectives on a Theory in Progress*, Jossey Bass, San Francisco, CA. ISBN: 0-7879-4845-4.
- Migliorini, P., Wezel, A., Veromann, E., Strassner, C., Srednicka-Tober, D., Kahl, J., Bügel, S., Briz, T., Kazimierzczak, R., Brives, H., Ploeger, A., Gilles, U., Lüder, V., Schleicher-Deis, O., Rastorgueva, N., Tuccillo, F., Talgre, L., Kaart, T., Ismael, D. and Rembiałkowska, E. (2020) 'Students' knowledge and expectations about sustainable food systems in higher education', *International Journal of Sustainability in Higher Education*, Vol. 21, No. 5, pp.841–859, ISSN: 1467-6370, Emerald Publishing, doi.org/10.1108/IJSHE-10-2019-0309.
- Nazir, J. and Pedretti, E. (2016) 'Educators' perceptions of bringing students to environmental consciousness through engaging outdoor experiences', *Environmental Education Research*, Vol. 22, No. 2, pp.288–304, doi:10.1080/13504622.2014.996208.
- Newberg, A. and Waldman, M. (2009) *How God Changes Your Brain*, Ballantine Books edition, ISBN 10:0345503422.

- Niranjanananda, P. (1999) 'Mind management in everyday life', *Yogamag*, September, Yoga Publications Trust, Bihar Yoga.
- Niranjanananda, S. (2013a) *Reflective Approach: SWAN Theory 'on the Wings of the Swan'*, Vol. 5, Yoga Publications Trust, Bihar Yoga.
- Niranjanananda, S. (2013b) *Tantra Darshan*, p.313, Yoga Publications Trust, Bihar Yoga, Pratipaksha Bhavana.
- Niranjanananda, P. (2015) 'Yoga', *Yogamag*, November, Yoga Publications Trust.
- Niranjanananda, P. (2016) 'Yoga science', *Yogamag*, July, Yoga Publications Trust.
- Niranjanananda, S. (2018) *Cultivation of Positive Values and Qualities from 'on the Wings of the Swan'*, Vol. 5, republished in *Yogamag*, June, Yoga Publications Trust.
- O'Sullivan, E. (2003) 'Bringing a perspective of transformative learning to globalized consumption', *International Journal of Consumer Studies*, Vol. 27, No. 4, pp.326–330, doi:10.1046/j.1470-6431.2003.00327.x.
- Pelletier, L.G., Tuson, K.M., Green-Demers, I., Noels, K. and Beaton, A.M. (1998) 'Why are you doing things for the environment? The motivation towards the environment scale (MTES)', *Journal of Applied Social Psychology*, Vol. 28, No. 5, pp.437–68.
- Petegem, P.V., Blicek, A. and van Ongevalle, J. (2007) 'Conceptions and awareness concerning environmental education: a Zimbabwean case-study in three secondary teacher education colleges', *Environmental Education Research*, Vol. 13, No. 3, pp.287–306, doi:10.1080/13504620701430331.
- Potter, G. (2009) 'Environmental education for the 21st century: where do we go now?', *The Journal of Environmental Education*, Vol. 41, No. 1, pp.22–33, doi:10.1080/00958960903209975.
- Ratnashakti, S. (2018) *Transforming Lobha (Greed)*, Yoga publications Trust, Munger, Bihar, India.
- Ronen, T. and Kerret, D. (2020) 'Promoting sustainable wellbeing: integrating positive psychology and environmental sustainability in education', *Int. J. Environ. Res. Public Health*, Vol. 17, p.6968, doi:10.3390/ijerph17196968.
- Satyananda, P. (2016) 'How can yoga change human life', republished in *Yogamag*, November, Yoga Publications Trust.
- Satyananda, P. (2017) 'The mysterious mind', republished in *Yogamag*, September, Yoga Publications Trust.
- Satyananda, P. (2018) 'Evolution and transformation', republished in *Yoga Magazine*, July, Yoga Publications Trust.
- Satyasangananda, P. (2013) 'Yoga ecology', *Yogamag*, August, *Yoga Publications Trust*.
- Sivamurti, S. (2013) *The 18 It Is of S. Sivananda and the Technique of Pratyahara*, Yoga Publications Trust.
- Sivananda, S. (1946) *Mind – Its Mysteries and Control*, pp.58, 87, 125, 134, 177, 183, 233, The Divine Life Society Publications.
- Skibins, J.C., Powell, R.B. and Stern, M.J. (2012) 'Exploring empirical support for interpretation's best practices', *Journal of Interpretation Research*, Vol. 17, No. 1, pp.25–44 [online] <http://www.interpnet.com>.
- Steg, L., Bolderdijk, J.W., Keizer, K. and Perlaviciute, G. (2014) 'An integrated framework for encouraging pro-environmental behavior: the role of values, situational factors and goals', *Journal of Environmental Psychology*, Vol. 38, pp.104–115, doi:10.1016/j.jenvp.2014.01.002.
- Stern, M.J., Powell, R.B. and Hill, D. (2014) 'Environmental education program evaluation in the new millennium: what do we measure and what have we learned?', *Environmental Education Research*, Vol. 20, No. 5, pp.581–611, doi:10.1080/13504622.2013.838749.
- Tal, T. (2010) 'Pre-service teachers' reflections on awareness and knowledge following active learning in environmental education', *International Research in Geographical and Environmental Education*, Vol. 19, No. 4, pp.263–276, doi:10.1080/10382046.2010.519146.

- UNESCO (1976) 'The Belgrade Charter', *UNESCO-UNEP Environmental Education Newsletter*, Vol. 1, No. 1, pp.1–2.
- UNESCO and UNEP (1977) *Tbilisi Intergovernmental Conference on Environmental Education*, October, Tbilisi, USSR, pp.14–26.
- United Nations Educational, Scientific and Cultural Organization (UNESCO) (1978) *Final Report: Intergovernmental Conference on Environmental Education*, UNESCO, Paris.
- United Nations, General Assembly (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development* [online] [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E).
- Vyasa (2nd century BCE) *Bhagavad Gita*, Printed and Published by Gita Press, Gorakhpur-273005, India, ISBN: 81-293-0437-6.
- Wals, A. and Dillon, J. (2013) 'Conventional and emerging learning theories: implications and choices for educational researchers with a planetary consciousness', in Stevenson, R.B., Brody, M., Dillon, J. and Wals, A.E.J. (Eds.): *International Handbook of Research on Environmental Education*, pp.253–261, AERA Routledge, New York. ISBN: 9780415892384.
- Wang, J., He, Y., Li, Y., He, X., Wang, X.F. and Jue, Y. (2004) 'An analysis of environmental awareness and environmental education for primary school and high school students in Kunming', *Chinese Education & Society*, Vol. 37, No. 4, pp.24–31, doi: 10.1080/10611932.2004.11031653.
- Waters, L. and Loton, D. (2019) 'SEARCH: a meta-framework and review of the field of positive education', *Int. J. Appl. Posit. Psychol.*, Vol. 4, pp.1–46, doi:10.1007/s41042-019-00017-4.
- White, L. (1967) 'The historical roots of our environmental crisis', *Science*, Vol. 155, pp.1203–1207.
- Wi, A. and Chang, C-H. (2018) 'Promoting pro-environmental behavior in a community in Singapore – from raising awareness to behavioral change', *Environmental Education Research*, doi:10.1080/13504622.2018.1528496.
- Žuk, P. and Žuk, P. (2018) 'Environmental awareness and higher education: differences in knowledge and the approach to ecology between students of technical sciences and the humanities in Poland', *Applied Environmental Education & Communication*, Vol. 17, No. 2, pp.150–160, doi:10.1080/1533015X.2017.1388196.