

Critical Thinking Through Global Learning

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Critical Thinking

- Is *“in short, self-directed, self-disciplined, self-monitored, and self-corrective thinking, which requires rigorous standards of excellence and mindful command of their use”* (Paul & Elder, 1999, P.2)

International Virtual Exchange



TECHNOLOGY
ENABLED



SYNCHRONOUS OR
NEAR
SYNCHRONOUS



STRUCTURED
INTERCULTURAL
EXCHANGE



STUDENT TO
STUDENT

Global Learning as Window to the World



Assist students in seeing the connections between their studies and the world outside the classroom



Increase awareness among students regarding global issues and challenges



Increase awareness on the effects of culture and society on global issues and challenges



Increase awareness and understanding of diverse student population



Improve communication skills

Spring 2021 IVE Project

Clemson University

Course: Introduction to
Environmental science and
Policy - ENSP 2000

Population: Sophomores to
Seniors

Field of Study: All majors

Tel Hai College

Course:

Population: Juniors

Field of Study: Biotechnology
majors

Methods

Shared Zoom meeting with the two groups

"Canvas Free for Teachers" for discussion and cooperation

Final presentations through *Zoom*

Courses Objectives

CU - ENSP 2000 (CT2, STS)

Basic principles of environmental science, including ecology, energy, resources, waste management; and air, water, and soil pollution.

Consideration of issues, specific cases, investigative approaches, and remedial actions.

Tel Hai College - Advanced Seminar

Advanced practice in scientific writing, an in-depth research study of a selected topic in the field of environmental science, writing a scientific manuscript, and giving a scientific presentation in a binding form.

Final Projects Titles

Tel Hai - Research Topic	ENSP 2000 Group - Final Project Topic
Microplastics in the marine environment and its impact on animals and the human food cycle	Microplastic in the ocean and its impact on animals and human food cycle.
Phosphorus recycling from agricultural wastewater and the circular economy to reduce its pollution to water and soil	Water pollution due to fertilizer runoff.
Large-scale biodiesel production from different oil types using immobilized lipase	Biodiesel production from different oil types in the US.
The impact of invasive insects on the development of eucalyptus trees and ecosystems in Israel	Invasive forest insects in North America.
A comparative economical and environmental overview of hydrogen production processes	Hydrogen production in the USA.

Final Project Titles- Cont.

Tel Hai - Research Topic	ENSP 2000 Group - Final Project Topic
The effect of climate change on underwater circulations on the shores of Israel / and an overview of circulations on the eastern coast of the Mediterranean region	The effects of climate change on the Atlantic Ocean
Production of energy from growing algae - limitations and challenges in the production process	Production of energy from growing algae in the USA.
The effect of the closures following the Covid19 pandemic on global warming and air pollution in particular	The effects of the closures following the Covid19 pandemic on global warming and air pollution in the USA.
Use of Entomopathogenic fungi in integrated pest control in agriculture	The use of Fungi as a biological control of pests in agriculture.
Wind energy - onshore versus offshore turbines to generate electricity	Wind energy for electricity generation in the USA.

Students' Reflections

- How did this international collaboration affected your understanding of global challenges related to our environment?
 - *"It was interesting to hear these topics explained from someone with a new perspective..."*
 - *"It made me realize that even though our environments may be very different and in very different places, we still face very similar issues."*
 - *"...People all over the world are aware of and trying to find solutions that we hear about all the time in America."*
 - *"It was really and eye opener..."*
 - *"It made me feel that I was a part of a solution to bigger issues than just our own."*
 - *"...to hear about these issue firsthand from international students really emphasized the meaning of global challenges."*
 - *"Overall, this project was a fun experience and pretty eye opening..."*
 - *"It was very interesting to see students from other county and the way they go about learning materials like the way we do..."*
 - *"...it provided a large awareness of how global challenges are not only similar across countries but also are connected throughout the world."*

Spring 2022 IVE Project

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Course:

Population: Juniors

Field of Study: Biotechnology
majors

Discussions



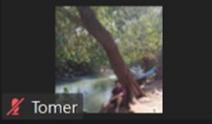
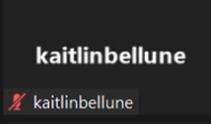
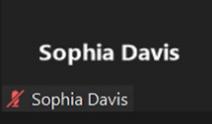
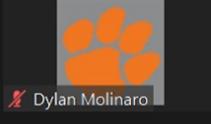
Presentations

Micro-Algae?

Microalgae are microscopic organisms found in both seawater and freshwater with more than 25,000 species already isolated and identified. These microorganisms perform photosynthesis, which is an important natural mechanism to reduce the atmospheric CO₂ concentration.

As an aquatic organism they have to deal multiple amounts of pathogens. Through out the evolution they have developed different mechanisms of dealing with different pathogens.



 Minory Nammouz	 Eyal Kurzbaum	 Elad Cohen
 Tomer	 dor horovitz	 Nicholas Jarrett
 Charles Parker	 Amber Cassidy	 ALEMNESH
 Maria Khoury	 Camille Desjardins	 Noam Efrat
Diyar Daoud  Diyar Daoud	ofir shorshy  ofir shorshy	kaitlinbellune  kaitlinbellune
Jillian McManus  Jillian McManus	Khadary Stephens  Khadary Stephens	Alex McKeel  Alex McKeel
Sophia Davis  Sophia Davis	Jamari Evans  Jamari Evans	 Dylan Molinaro

Your Project's Topic

In this discussion post, we will start discussing your project's topic.

Tel Hai students: please post your project topic with a brief explanation of the topic and why you chose it. Does it relate to your current major or future career?

Clemson students: please reply to at least two of your international peers' posts. In your reply, please tell us if you think that the topic presented by your international peer is considered a global challenge and give specific constructive comments on your peers' posts.

Your Project's Topic

Tel-Hai Student

"I chose to study green energy, or more accurate, alternative energy. We all know that our resources in the world are limited and more over the way that we use them today are polluting the planet. I'm really interested in finding a green, cheap way to make our "leftovers" from the industry into energy. I think I will focus in this semester on using the gas that is emitted from factories and making the greenhouse effect and reuse it to create energy"

Clemson Students Replies:

- *"I think this topic is definitely considered a global challenge. I think this is an awesome topic and can not wait to hear more about it!"*
- *"I definitely think your topic is considered a global challenge. It is so important that we reduce all leftover waste on our planet, and it would be so beneficial to reuse it towards creating natural energy sources. I can't wait to find out how you plan to use the gas emitted from factories towards this 'green' mission."*
- *"I find green energy very interesting, and I believe it is an extremely important global topic. I am an Architecture major, and I have been focusing on green and sustainable design, especially when it comes to green energy and conserving/reusing it. Though it comes mainly from factories it is quite interesting to see how much comes from other commercial buildings and how it all adds up. If we can find a green alternative, and implement it among all commercial buildings and factories, possibly even residential buildings, it will make a great difference."*



Examples from Students' Presentations

Regenerative Agriculture

What initiative might you take as a current student or future leader to help our environment? Do your international peers support your idea? Why or why not.

- As I current student, one might plant some trees, flowers, or shrubs in an area to help diversity and to protect the soil surface. One of the ways to help prevent runoff, which is a major problem with regenerative agriculture, is to make a rain garden which prevents soil runoff.
- As a future leader, one might buy livestock and raise them to help livestock integration. Livestock could be cows, chickens, pigs, etc. By raising livestock you will promote healthy plants and high impact mob grazing which will promote healthy soil, crops, and humans
- You can also start composting 1:1 ratio of plants to organic matter and after awhile it decomposes to be nutrient rich soil.
- Our international peer (Ofir Shorshy) supports these ideas. She even has some livestock of her own and she says she composts.



Human Uses of Algae

Initiatives We Can Take

What Can We Do?

Clemson Students

- “We can take initiative by researching and learning more about the different ways algae can be used to better our environment through pharmaceuticals, cosmetics, and water supplies.”



Tel Hai Student - Elad

- Has worked in a government organization that helped protect nature.
- Speaks to people around the river about keeping trash out of the water.
- Informs others about why it is important to protect the environment.
- “The main way I think I can help right now is to study and do research on microalgae.”

Green Urban

Building on Netanel's perspective...

Society

- By 2050 Earth will be home to 10B people
- As humans grow, nature and biodiversity wane
- There will not be enough fossil fuels to support future populations... we must begin being sustainable
- we must change the relationship, regarding how humans and nature interact in society... improve by including nature in cities through green urban
- besides biodiversity and a lack of resources, society is creating a planet that won't be liveable
- CO2 and greenhouse gases trap heat, attributing to global warming and climate change

Human Health

- Netanel briefly mentioned how green buildings improve human health
- we looked further into health
- fossil fuels release pollutants that cause "early deaths, heart attacks, respiratory disorders, stroke, asthma, and absenteeism at school"
- correlations to autism and Alzheimer's as well
- 8m deaths in 2018 associated with fossil fuel pollution (1 in 5)

Business and Economy

- Netanel talked about the roots to the Industrial Revolution
- he mentioned green tax
- he noted that it is a long process calling for government funding and initiation NOW
- central government policies single handedly can create green transition
- it is up to government to implement these policies and plans
- OECD is creating programs to promote sustainable policies and green urban efforts
- economy is based on fossil fuels, must be prepared to change



BOSCO VERTICALE (VERTICAL FOREST), MILAN

- Inspired Netanel, living in Italy
- Sustainable building
- Regenerates environment and biodiversity
- Removed carbon from the air
- Operates alongside policies calling for naturalization of urban areas
- First example of a vertical forest



Students' Reflections

Please let us know how did this experience help you in communicating your project topic and how the interaction within this project helped you realize that your topic is a global challenge. Would you be interested in such cooperation in the future? Will you recommend this experience to a friend? Why or Why not?

- *"I very much enjoyed the experience I had during this IVE project. This experience helped me in communicating my project topic because by listening to my international partner speak about our topic, it taught me more about the topic and gave me a reason to do research. The interaction I had within this project helped me realize that my topic was a global challenge because it provided me with a lot of information and allowed me to really research more about how the use of algae is a global challenge and what all we can do about it. I would definitely be interested in doing this again in the future and would recommend this experience to a friend. This whole project was very eye opening and made me more aware of global challenges that are happening in this world today. "*
- *"I really enjoyed getting to know the Tel-Hai students and learning more about their research projects. Talking to our group's partner really helped me understand our research topic. I could ask questions and get a good introduction to the topic before doing more research on my own. It was such an interesting experience to learn about how these challenges are being approached globally. I would defiantly recommend this experience to a friend because it was such a good learning opportunity. Thank you for a great semester!"*

- *"This experience was really different from anything I have experienced in a class or through Clemson before. I enjoyed getting to discuss such important topics with international students, and hear their perspectives and knowledge on these issues. I definitely learned a lot through our international partners, along with the research done independently on our topic. I would recommend this cooperation to a friend as well as I would be interested in this experience again because it helped me get engaged with the topic and our groups."*
- *"It was very nice to meet you all. Meeting people from an entirely different part of the world should be something easy to do in modern-day, but it's still such a rare occurrence. I figured the whole world would have similar issues, and while it is somewhat the case, talking with you guys made me see that some places are affected harder by some of these global challenges. For example, Dor told me a story of how he went to California and had a much harder time breathing, simply because the air quality was so poor. I would be interested in such cooperation in the future, as this has been a good experience. I do wish however that we were only more involved in each other's work like we actually made our presentations together. Overall though, I would recommend this experience to a friend. It's quite nice."*

- *"I really enjoyed this experience! Working together with our international partners really broadened my perspective on how global issues affect people all around the world. It was a pleasure to work with my group's Tel Hai partner Noam, and his topic (Remote Sensing) was really innovative, interesting, and a great way to tackle global issues on agriculture and water resources. I didn't even know remote sensing was a thing until this project, and now I am very interested in learning more about it! I would absolutely be interested in doing something like this again in the future, and I would recommend this experience to a friend because it's a great opportunity to learn more about both international cultures and about global environmental issues."*
- *"This project was a great opportunity to connect with students our age on the other side of the world, and also provided a great opportunity for learning as well. It was super helpful to hear from my Tel-Hai partner, regarding his perspective that has developed as a result of his background and experiences in life. That goes to show how a lot of the issues discussed in the course of this class stretch far around the world, posing a global issue and challenge that call for change. I would very much so be interested in participating in a project like this in the future down the line. I loved working with different students from another school and found it to be interesting, fun, and informative. Overall, just a great experience! I would definitely recommend this project and experience to a friend as a great, fun, and unique way to learn. "*



QUESTIONS?



THANK YOU