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Using Modern Telecommunication Technologies to Develop International Scientific and Educational Network within Universities

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Preface

A joint project within the framework of Russia-ASEAN cooperation "Design and Development of ASEAN - Russia Interactive Communication Network for the Exchange of Innovative Technologies on Sustainable Agricultural Development" was launched in 2020. The project was initiated by Lomonosov Moscow State University (MSU, Russia) and Hanoi University of Science, Vietnam National University (VNU HUS, Vietnam) in 2019. The members of these two universities comprised the Task Force of the project.

When submitting the project proposal, the project was not expected to prove so extremely relevant under a pandemic situation, when the whole world faced isolation and a lack of face-to-face communication. This project pursues other international joint projects to distribute environmentally friendly agricultural technologies and it allowed us to find more participants and more issues for discussion.

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Each team was provided with a coordinator and coaches to assist the students in working on their project. In addition, the teams had an opportunity to consult with world-class experts from Russia and Europe (Italy, France, the Netherlands, and Finland).

The aim of the project was to teach the students practical skills in assessing the environmental state of water bodies in agricultural regions and to offer solutions to improve water quality for a specific water body. Special attention was paid to the skills required for project work and scientific presentations.

The project is of high importance since clean water is becoming crucial for the development of agricultural regions.

The issue of water pollution is alarming as clean and fresh water is becoming scarcer and more expensive every year. Nowadays, the number of wastewater treatment technologies is growing, but there is a lack of specialists who are aware of these technologies. Biological treatment is not only the most efficient and safest wastewater treatment technology, but also the cheapest and most energy-efficient.

Agricultural regions are recommended to use the technology of Constructed Wetlands (CW) as it fits the landscape. The specialists in CWs should have broad scientific knowledge of various technological methods, as well as engineering skills.

Each team had to choose their local water object: Indonesia – Buyan Lake, Vietnam – Phan River, Thailand – Nong Han Lake, Laos - Nong Bungwa Lake, Philippines – Paoay Lake, Russia – the Moskva River.

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In the first six months, the student teams carried out research on their water bodies by collecting data on the main sources of pollution, as well as on natural and socio-economic factors affecting the state of the target water body. The work used both field research data and available monitoring data. As a result of data collection, the teams identified the main problems to solve: 1) improving water quality; 2) restoring local ecosystems, and 3) improving life quality of the local population surrounding the target water body.

At the second stage the students had to develop a long list of solutions for the identified environmental problems. Simultaneously, they got acquainted with the latest and most suitable water treatment technologies such as CWs for their regions. The project involved a series of lectures by world-class experts in various areas of science and technology on the following topics:

- ·Preliminary design studies of CWs;
- ·Development and calculation of CW technological schemes;
- ·Fundamental differences and advantages between activated sludge systems and CWs in agricultural regions;
- ·Features and benefits of different subtypes of CWs for agricultural regions;
- ·Using GIS for CW site selection;
- ·Methods to assess and research diffuse runoffs polluting water bodies in agricultural regions;
- ·Principles of making a project on CW construction.

During that stage expert consulting was also provided to the students in order to assess their ideas in quality and practical applicability.

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At the end of the second stage, the student teams developed their own projects for the selected water bodies using the new knowledge obtained from the experts. The team coordinators and coaches helped students develop a single and unified project presentation format for the next stage.

The third stage was the most interesting and important: the teams had to present and discuss their projects together.

A significant part of the project was the technical preparation and organization of the actual telecommunication network among the participating universities. Initially, we evaluated available university equipment and the possibility of its connection and compatibility into a single network. The necessary equipment was purchased for some universities.

After that, the Technical Project Administrator conducted a few test connections and checked the operation of all nodes of the network. The teleconference format involved bilateral meetings among all participating teams. Thus, each team had an opportunity to discuss their project five times. After each meeting the teams could gradually improve their project considering comments and remarks. This format of meetings was chosen on purpose to show the strengths of each participant. It is understood that each university has different educational programs, hence different approaches to solve environmental issues. This format allowed the students to evaluate their project from an unusual point of view and supplement it with new ideas.

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Fifteen bilateral meetings and two joint meetings (Welcome and Final meetings) were held among the six teams. The communication skills of the teams were practiced not only at official meetings, but also during informal meetings organized by the students (with the help of the project Task Force) to discuss the topics of their choice.

The students have acquired the skills in the following activities:

- teamwork;
- presentation of a scientific project;
- conducting a scientific discussion;
- reviewing and opposing a different scientific work;
- practicing English for Specific Purposes (ESP) in discussions with non-native speakers of the English language.

Thus, all student teams have significantly increased their capacity building.

It is worth noting that this telecommunication platform is different from most systems of Internet knowledge sharing as it creates an interactive network of experts and students as opposed to one-direction flow of knowledge. Analyzing new publications on innovative technologies on a regular basis will allow students to adapt and share agricultural and environmental innovations in their locality.

The telecommunication network encourages the ASEAN countries to develop scientific schools focused on environmental technologies and innovative agricultural production which is becoming extremely urgent and demanded.

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The fourth and final stage of our work was teaching the students to write English scientific articles for an international scientific journal on the basis of their accomplished projects. This skill is crucial for those who are engaged in practical projects as only scientific articles can accelerate the exchange of scientific and practical knowledge.

In addition to the regular meetings with lectures and presentations, the students participated in a series of informal meetings, the goal of which was to help students get to know each other, enhance their English language skills, and create a friendly atmosphere among the teams. During the meetings, the students were encouraged to make presentations and discuss a wide spectrum of themes: from cultural peculiarities and holidays of their countries to career prospects and preferred professional paths.

The informal teleconferences proved to be an important element for strengthening informal ties among students, helping them feel and participate in the teleconferences in a very confident manner. This will also contribute to their professional growth and future career as specialists of international level.

Articles of the six student teams are further presented in this journal issue. For more information about our experience in implementing interactive international educational programs, please visit our website (http://aeuclub.com/project-based-learning/).

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