

The 'Active Prosthesis' by DTU Students Wins Second Prize at SV-STARTUP 2024

People with leg disabilities in Vietnam face many challenges in mobility and daily activities, while the cost of using imported active prostheses is too high. To address this issue, the Flexi Leg team from DTU, composed of Ho Ngoc Huy, Nong Thao Le, and Dang Ngan Ha, conducted research and developed a model of an 'Active Prosthesis' with a unique design, safety, low cost, high quality, and suitability for the physical characteristics of disabled individuals in Vietnam.

Successful in researching and developing the 'Active Prosthesis' with many advantages such as low cost, lightweight, high adjustability, easy maintenance, and notably, the product is in the process of patent registration, the Flexi Leg team from Duy Tan University, consisting of: Ho Ngoc Huy, Nong Thao Le, and Dang Ngan Ha, excelled and were awarded the Second Prize at SV-STARTUP 2024 and the National Startup Day for Students 2024 in the field of Technology & Product Manufacturing. This remarkable product not only demonstrates creativity and extensive expertise but also shows the responsibility towards the community of the young generation of Duy Tan University students.

The idea of the 'Active Prosthesis' product originates from the fact that people with leg disabilities in Vietnam encounter difficulties in mobility and daily activities, while the cost of using imported active prostheses is prohibitively high and not suitable for the economic conditions of many families. To address this issue, the Flexi Leg team from Duy Tan University, consisting of Ho Ngoc Huy, Nong Thao Le, and Dang Ngan Ha, conducted research and developed a model of the 'Active Prosthesis' with a unique design, safety, low cost, high quality, and suitability for the physical characteristics of disabled individuals in Vietnam.



The Flexi Leg team from DTU won the Second Prize at SV-STARTUP 2024

To successfully research and develop the product, the group surveyed the dimensions of lower limb models of Vietnamese people across different age groups, thereby selecting common sizes to design the 3D model of the 'Active Prosthesis' along with machining drawings to manufacture and assemble the product successfully. The designed product includes main components such as:

- knee joint,
- calf, and
- foot.

In particular, the knee joint uses a hydraulic shock absorption system to support flexion-extension movements, while the extension movement is supported by a spring. The students meticulously calculated technical parameters such as shock absorption force, body weight, and the torque generated by the hip joint to ensure safe and suitable operation.

Under the guidance and advice of lecturers and specialists from the Mechanical Engineering Technology Center - CME (School of Technology, SET), the 'Active Prosthesis' product was completed with the significant feature that all components were successfully manufactured at the Mechanical Engineering Technology Center - CME of DTU without importing any components. As a result, the product significantly reduced costs, making it easier for people with leg disabilities in Vietnam to access the product.

The efforts and creativity of the Flexi Leg team were recognized when the team won the Second Prize at SV-STARTUP 2024 and the National Startup Day for Students 2024 in the field of Research & Product Manufacturing. Currently, the group has submitted an application for Intellectual Property Ownership for the product and established website channels and fan pages to commercialize the product.



People with disabilities testing the 'Active Prosthesis' product from DTU

Previously, the 'Active Prosthesis' product by the Flexi Leg team received high praise and won the 2nd Runner-Up award at the Accessibility Design Competition (ADC) - Accessibility-Oriented Design 2023. These awards are recognition of the creativity in design and manufacturing aimed at practicality for users as well as the heartfelt desire to provide useful solutions for disabled individuals in Vietnam by DTU students. The 'Active Prosthesis' product also creates a feasible entrepreneurial opportunity for students while still in university, contributing to improving the quality of life for people with disabilities.

The 'Active Prosthesis' product by the Flexi Leg team continues to participate in the "ASEAN Virtual Entrepreneurship Hackathon 2023" with the theme "ASEAN Green Entrepreneurship Hackathon" from October 2023 to July 4, 2024. This competition will provide an opportunity for participants to apply

problem-solving skills, propose innovative solutions, and explore opportunities to commercialize ideas into products or services in the future.

As talented students with a passion for scientific research and entrepreneurship, Ho Ngoc Huy - a student of Electrical Engineering (PNU standard) along with two Marketing & Strategic Management students (Talent Program) Nong Thao Le and Dang Ngan Ha, coincidentally met and found similarities in their studies and research to connect and implement the product together.

"The biggest challenge we faced was at the initial stage of product implementation when we were still unfamiliar with each other, so there was some hesitation in exchanging ideas and working together, especially when there were occasional differences in opinions. But then very quickly, we 'tuned into each other's frequencies' and steered everything in the right direction. The luckiest thing for us is that thanks to the startup ecosystem of DTU along with advisors from the School of Business (SBE), School of Engineering Technology (SET), who supported and guided us enthusiastically so that the group could find the most suitable direction for the project and achieve the results as today," shared Nong Thao Le, a student.



Ho Ngoc Huy: As the only male member of the team and also the one responsible for technical aspects and production, operation, Ngoc Huy considers himself a very cheerful, sociable person who enjoys sports, reading books, and listening to music. Ngoc Huy's life motto is "When you dare to try, your chance is at least greater than 0%; but if you don't dare to try, your chance is a flat 0%." With that motto, Ngoc Huy always strives his best in everything from studying, researching to working. Participating in the production of the 'Active Prosthesis,' Ngoc Huy feels very happy because he has learned a lot of knowledge and can apply it most effectively in reality. Passionate about studying and researching, Ngoc Huy plans to continue his education further after completing the university program and aims to achieve a Ph.D. degree.



Nong Thao Le: A rather interesting girl who enjoys playing sports, and her favorite sport is volleyball. Besides, Thao Le is a person who loves food and always dreams of being able to set foot in all 63 provinces and cities of Vietnam to explore the unique culinary and cultural characteristics of each region.

Being someone who loves to explore the world, but she doesn't hesitate to spend hours improving her knowledge, researching science. Perseverance has brought initial success when the 'Active Prosthesis' product was highly appreciated in many competitions and product introductions.



Dang Ngan Ha: A lively, cheerful, and dynamic girl. Ngan Ha's hobby is meeting, exchanging, and making friends with everyone. It is her lively personality that has helped the three friends in the Flexi Leg team quickly become close to easily implement ideas and accompany each other. Ngan Ha's dream is to become a lecturer at DTU, standing on the podium to impart knowledge, skills, and experiences that she has acquired to the younger generation.

At this competition, students from universities in the Central Highlands region won awards:

- The project "Durian peeler" by students of Tay Nguyen University won First Prize in the Technology & Product Manufacturing field.

- The project "Active Prosthesis" by students of Duy Tan University won Second Prize in the Technology & Product Manufacturing field.
- The project "BCDTI - Environmentally friendly scalp protection wrap" by students of the Vietnam-UK Research and Training Institute, University of Da Nang, won an Encouragement Prize in the Technology & Product Manufacturing field.
- The project "BINKS - Vegetable Ink - A New Direction for Green Agriculture" by students of the Vietnam-UK Research and Training Institute, University of Da Nang, won First Prize in the Agriculture, Forestry, and Fisheries field.
- The project "Asthma warning bracelet - ASTHSULE" by students of the University of Economics - University of Da Nang won an Encouragement Prize in the field of Health Care, Beauty Technology.

(Media Center)