LATIN AMERICA PRACTICES AND SOFT SKILLS FOR

LAPASSION

AN INNOVATION ORIENTED NETWORK

585687-EPP-1-2017-1-PT-EPPKA2-CBHE-JP

OA2.2.2 - Teams' Reports – Distance/Online projects

Developed by TAMK, IFTM, IFAM, IFG, IFSUL and IPP

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Contents

1. INTRODUCTION

LAPASSION (Latin-America Practices and Soft Skills for an Innovation Oriented Network) is a project from the program Erasmus+ within the line KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education (reference 585687-EPP-1-2017-1-PT-EPPKA2-CBHE-JP). It involves partners from Portugal, Finland, Spain, Brazil, Uruguay, and Chile. LAPASSION consortium has as motivation to create a unique solution to address different problems affecting youth in HEI, helping students to obtain a better training in terms of innovation, soft skills, and internationalization. This solution is obtained by LAPASSION MP/I (Multidisciplinary Projects/Internships) for students' teams to help them to co-create, and co-develop projects proposed by enterprises and other organizations, or to accelerate innovative ideas in an international context involving students from several countries.

The aim of LAPASSION is to increase the innovation culture of HEI and the connection with Enterprises/Organizations (E/O) with impact in Employability, and Internationalization. This aim is pursued by implementing multidisciplinary projects/internships(MP/I) for co-creation, co-development and acceleration of innovative ideas, integrated in the educative project of the involved institutions. MP/I will be implemented by means of students' teams involving students with different backgrounds, different graduation levels, and from different countries, and solving challenges posed by E/O.

1.1 Consortium of LAPASSION

LAPASSION is a consortium with 15 partners, including 13 Higher Education Institutions (4 from Europe and 9 from Latin America), 1 Association of Enterprises from Portugal, and 1 Council of the Federal Institutes from Brazil. The list of the partners is the following:

Polytechnic of Porto (IPP, Portugal)
Tampere University of Applied Sciences (TAMK, Finland)
University of Vigo (UVIGO, Spain)
University of Salamanca (USAL, Spain)
Federal Institute Riograndense (IFSUL, Brazil)
Federal Institute of Triângulo Mineiro (IFTM, Brazil)
Federal Institute of Goiás (IFG, Brazil)
Federal Institute of Maranhão (IFMA, Brazil)
Federal Institute of Amazonas (IFAM, Brazil)

University of the Republic of Uruguay (UDELAR, Uruguay)
Technological University of Uruguay (UTEC, Uruguay)
Foundation of Professional Institute (DUOC, Chile)
Catholic University of Chile (PUC, Chile)
Association of Enterprises of Portugal, Commerce and Industry Chamber (AEP, Portugal)
Council of Federal Institutes of Brazil (CONIF, Brazil)

IPP is the coordinator institution of the project.

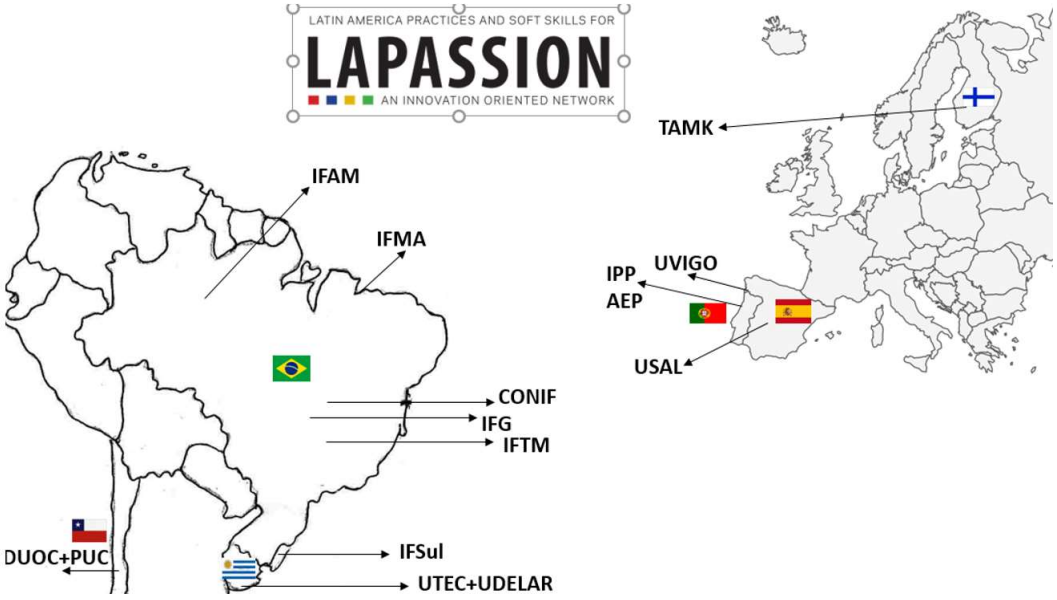

Figure 1 - LAPASSION partners in Latin America and Europe

1.2 Workpackages of LAPASSION

LAPASSION involves the following Workpackages:
WP1 – Preparation and Training for Multidisciplinary Projects/Internships (MP/I)
WP2 – Development of MP/I
WP3 –Quality Planning & Control (QP&C)
WP4 –Communication Plan, Dissemination and Exploitation Strategy
WP5 – Management

The Development of Multidisciplinary Projects/Internships (MP/I) is a very important aspect for the project, and a specific Work package (WP2) has been included for this purpose. One of the important issues is the Teams' Work Planning.

In a period of 10 weeks students needed to concentrate in the development of their

projects/internships. During this period students reported the evolution of the MP/I to a blog, every week. This report describes briefly what has been achieved in each project that has been partially or completely developed at distance and online mode. Projects developed in presential mode are described in the report OA2.1.2.

2. THE LAPASSION DEVELOPMENT PROJECTS

LAPASSION involved 7 editions (sets) of projects plus several other additional editions (3 in Porto, 4 in Uruguay, and 1 in Brazil), in a total of 15 sets of projects.

The challenges selected by the 7 original editions of LAPASSION were the following:

- Santiago/Chile (April-June 2018): How to improve conditions for Senior Populations?
- Uruguay (March-May 2019): How to improve conditions for children?
- Uberaba/Brazil (March-May 2019): Food for the Future
- São Luís/Brazil (March-May 2019): How to improve the Human Development Index (HDI) of the State of Maranhão?
- Manaus/Brazil (March-May 2020): Socio-Environmental Technologies for the Sustainability of the Amazon
- Goiania/Brazil (March-May 2019): How to contribute to an Inclusive and Sustainable Society?
- Pelotas/Brazil (September-November 2021): Accessibility and Assistive Technologies

In the current report we will focus our attention in the three last editions, since they were partially or completely developed in distance/online mode. The first 4 editions (Santiago, Uruguay, Uberaba, and Montevideo) are described in report OA2.1.2.

3. THE DISTANCE/ONLINE DEVELOPMENT PROJECTS

LAPASSION Multidisciplinary Students' Projects were conceived to be a presential experience, and this was happened during 2018 (Santiago-Chile edition) and 2019 (Uruguay, Uberaba-Brazil, and São Luís – Brazil editions). However, Distance/Online development was previewed in LAPASSION proposal application, more in a form of combining some students in presential mode with some other in distance/online mode. This was previewed even for a Sustainability of the project. The reality was different, and distance/online development was adopted from one day to another due to the coronavirus pandemic. LAPASSION@Manaus and LAPASSION@Goiania editions of LAPASSION were programmed to be completely in presential mode, and they start at the beginning of March 2020.

However, coronavirus pandemic impacted worldwide at the beginning of March and after 2 weeks of presential development in Manaus and 1 week in Goiania the projects went to distance/online mode, since that most of students must return to their cities (remember that besides the health problem the flight connections were strongly affected, and it was a risk of suspension of flights that happened some weeks later). It was a big learning for LAPASSION, like changing the wheels' tires with the car moving, but it was achieved with success, and that shows the resilience of LAPASSION students, coaches, and institutions. It was a critical situation not expected at all, not present in the Recovery Plan, but as it can be seen here, the quality of the multidisciplinary students' projects was like the presential projects. The students' team's cohesion of LAPASSION@Manaus and LAPASSION@Goiania was formidable, showing that one or two presential weeks can do a lot for the students' teams functioning. The situation was more difficult in LAPASSION@Pelotas, since students do not meet each other in presential mode (with the exception of students from the same country). However, we are very satisfied with the results of the students' projects of Pelotas.

3.1 LAPASSION@Manaus

LAPASSION@Manaus was held by Federal Institute of Amazonas (IFAM), in Brazil. As referred before that students' projects started in presential mode and due to the coronavirus pandemic situation were converted to distance/online development. With the main challenge of "Socio-Environmental Technologies for the Sustainability of the Amazon" sub-challenges have been launched by different entities like the enterprises Caloi (a big bikes' manufacturer in Latin-America), and Samsung, and institutes like Transire (Institute of Technology and Biotechnology of Amazonas), and the Federal Institute of Amazonas, the Secretariat of Environment of the State of Amazonas (SEMA), and the Foundation Sustainable Amazonas (FAS).

Subchallenge: Sustainable Bike
Counterpart: Caloi
Team members:
Vitor Martins Nogueira, Bioresources, IPP, Portugal
María Constanza Quezada Silva, Industrial Design, DUOC
Ana Carolina Paiva e Silva, Mechanical Engineering, IFAM
Raphaela Lima de Araujo Goes, Software Engineering, IFAM
Matheus Ben-Hur Ramirez Sapucaia, Mechanical Engineering, IFAM
Description:
Ths team, Team 1, received the sub-challenge "Sustainable Bike". As a result, they mitigated the impact of the bike life-cycle. All the plastic components of bikes were identified, proposing the substitution of them by bio-based materials. The project was developed with counterparts from

Caloi, the largest Brazilian manufacturer of bicycles.

The behaviour of the bicycle's parts made with petroleum-based plastics and the renewable sugarcane-based bioplastics were shown. How the replacement could be carried out and how it would make the bicycle manufacturing process more sustainable and less polluting. The team also sought to address the UN Sustainable Development Goals, such as Innovation and Infrastructure, Sustainable Cities and Communities, Responsible Consumption and Production, and Climate Action.

Figure 2 – Team members during a visit to Caloi Plant

Figure 3– Identification of components of a bike that can be substituted by bio-based materials

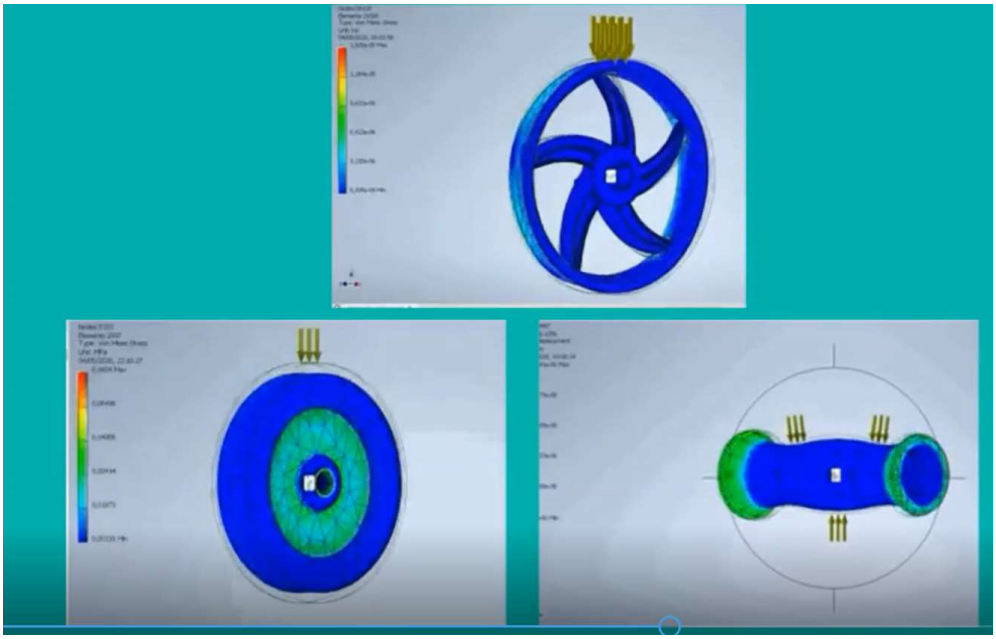

Figure 4– Analysis of the performance of bio-based materials

Subchallenge: Low-cost methods in drinking water generation
Counterpart: Transire
Team members:
Martin Samuel Sirén, Nursing, TAMK
Lucas Silva Pinheiro, Electrical Engineering, IFMA
Ananda Santiago de Oliveira, Veterinary, IFAM
Sarah Feitoza da Silva, Logistics, IFAM
Rodrigo Moura de Carvalho, Software Engineering, IFAM
Raiza Campos Lucena, Advertising, IFAM
Description:
Team 2 received the sub-challenge "Low-cost methods in drinking water generation". Despite being in a place with huge amount of water many communities have not access to drinkable water. As result, we work in a proposal of a filter (A'Calhar filter), a solution to install to the gutter and filter rainwater. The product comes with a booklet with information of water contamination, gutter cleaning, alternatives for building your own filter and maintenance of the filter. The project involved counterparts from Transire Institute – Technology and Biotechnology of Amazonas.
The filter has a kit with material to build it and a manual on how to do it. The filter can be placed directly on the gutter to capture rainwater. As coaches, the team members monitored the execution of the booklet, with educational information on the importance of drinking water, on the usefulness of the filter, ways of maintaining and cleaning the gutter, using home-made materials for water

purification, as well as the operation of the product, which was named “A'calhar”.

Figure 5– The kind of houses of Amazon communities to benefit from the Team’s project

Figure 6- Solution for direct filtering of rain water

Figure 7– The filter developed by the team

Subchallenge: Reuse of Electronic Devices
Counterpart: Samsung
Team members:
Sara Matilda Valavaara, Media and Arts, TAMK
Camila Victoria Lienlaf Vergara, Design, PUC
David dos Santos Costa, Environment, IFAM
Amanda Sales da Silva, Advertising, IFAM
Description:
The Team 3 received the sub-challenge “Reuse of electronic devices”. In fact e-waste is a major concern because of toxic substances involved. The proposal is to create a Microcomputer club, in which participants can use components of old mobile phones. The club involves students and teachers, and members learn how to address real problems of isolated communities. Together with processors like Arduino these components build interesting systems and reuse electronic devices. An Arduino club has been proposed. The project involved counterparts from Samsung.
The solution found has every possibility of being operationalized at IFAM. The students and teachers of the various technical training programmes at medium and higher institution levels would be the Arduino Club members. Later, with the project's success, the solution could be expanded to other establishments, such as state technical schools and specialized centres for technical and professional training.

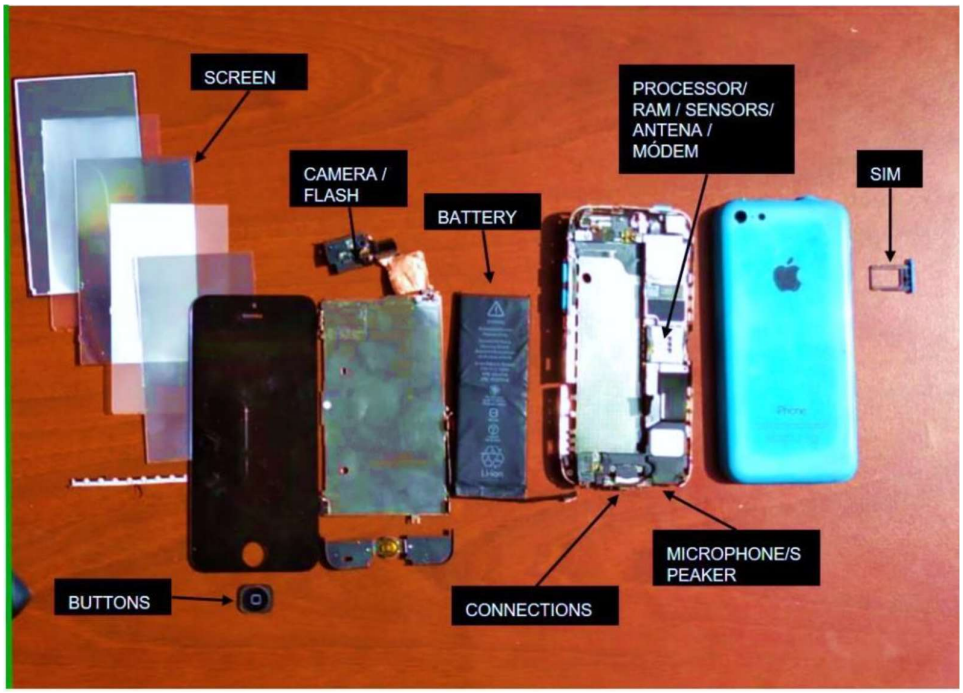

Figure 8– Electronic device (smartphone) and their components

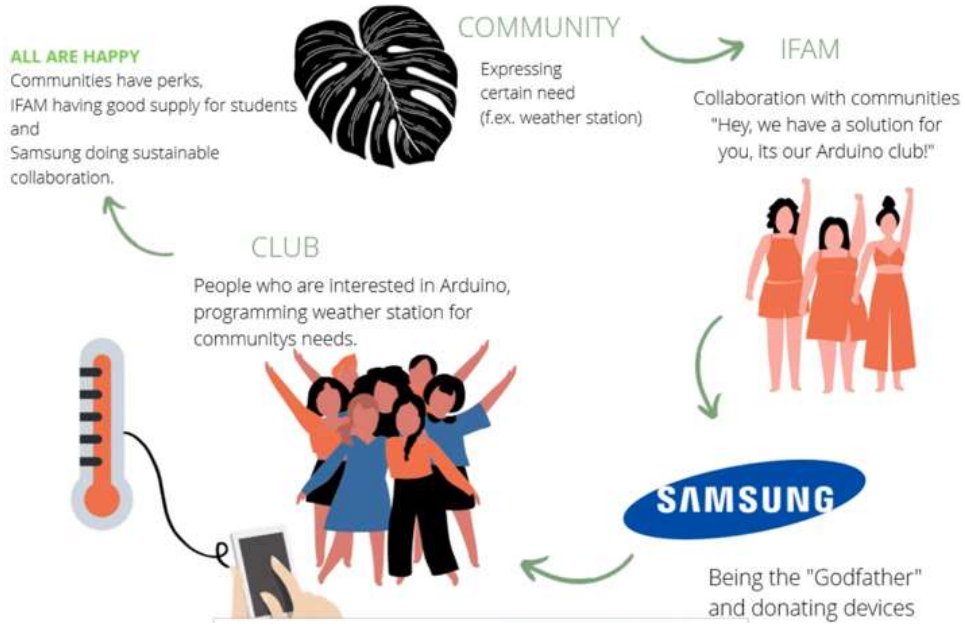

Figure 9– Arduino club, a way to reuse edectronic devices

Subchallenge: Efficient Environmental management to public instituitions
Counterpart: Federal Institute of Amazonas
Team members:
Alberto Infante Willson, Design and Innovation Engineering, PUC
Luzia Emanuelle Rodrigues Valentim da Silva, Mechanical Engineering, IFMA
Melyssa Oliveira Gomes, Biological Sciences, IFAM
Jamille Miranda dos Anjos, Pedagogy, IFPA
Lucas Gomes Flores, Control and Automation, IFAM
Description:
Team 4 received the sub-challenge “Efficient Environmental management to public institutions”. As result, they worked in a proposal of a Waste Separation station that sensitizes the care of the Environment through visualization in a Community Network. The station involves sensors for monitoring and a camera for people pictures that can be shared if desired. An EcoPoint manual was developed. Visual contents were developed as well. The project involved counterparts from IFAM, the Federal Institute of Amazonas.
The ecopoint station was designed and idealized to contain information about recyclable and non-recyclable, in its front part and a camera to capture the interaction actions between this and the user audience. The capture takes place using a sensor that, when feeling the addition of residues, captures the image and shows it on a screen (monitor or television) to disseminate positive attitudes towards the environment. This monitor or television was designed to remain in circulation on the Campus, showing images and videos with informational messages on sustainability actions and guidelines in a fixed way.

Figure 10– Ecopoint visión - front

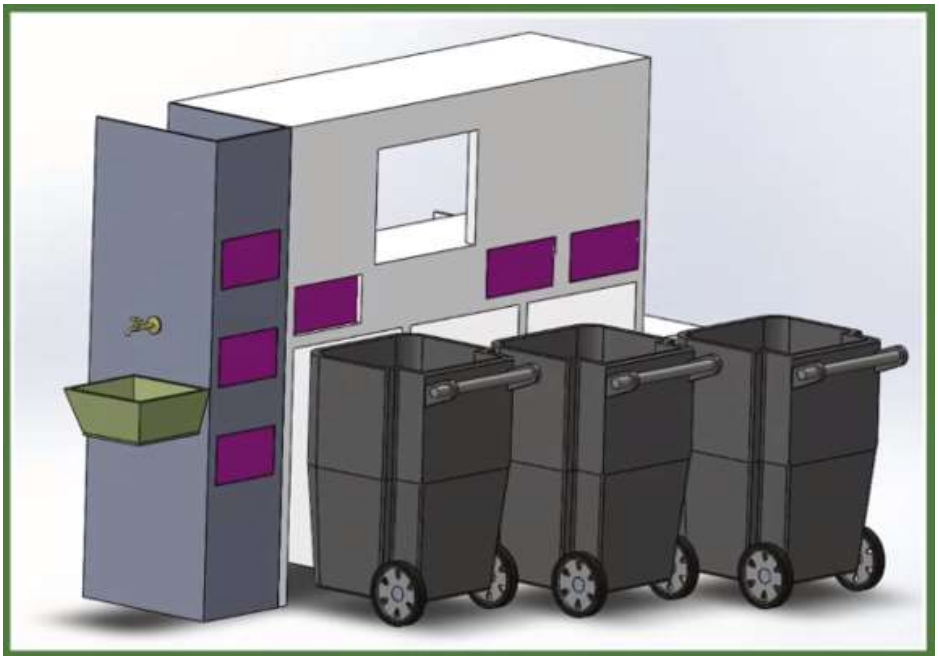

Figure 11– Ecopoint visión – 3D

Figure 12– Team members of the subchallenge "Efficient Environmental management to public instituitions"

Subchallenge: Insertion of sustainable productive chains of conservation units in the Market
Counterpart: Secretariat of Environment of Amazonas state (SEMA)
Team members:
Jennifer Alejandra Condemarín Guzmán, Tourism and Hospitality, DUOC
Lucyanna Moura Coelho, Environment, IFAM
Ana Carolina Paiva e Silva, Mechanical Engineering, IFAM
Vitor Leonardo Batista dos Santos, English and Portuguese Languages, IFAP
Kennedy Lima de Azevedo, Advertising, IFAM
Description:
Team 5, received the sub-challenge "Insertion of sustainable productive chains of conservation units in the Market". As result, the team identified some of the main products of Amazonia and developed a booklet (Business of the Forest) and the visual identity. Using Infographics, they helped in the formalization of the Business, in the marketing Plan, in a Geographical Identification Seal, and in the creation of an Association. A good example of Visual Identity was found for Jatobá, a product for Biocosmetics and Phytomedicine. The project involved counterparts from SEMA, the Secretariat of Environment of Amazonas state.

Figure 13– Analysis of some possible products from Amazonia

Figure 14– Visual identity of Jatobá, a producto for Biocosmetics and Phytomedicine

Figure 15– Team members of the subchallenge proposed by SEMA

Subchallenge: Sharing knowledge tool in the schools of the Conservation Units
Counterpart: Sustainable Amazon Foundation (FAS)
Team members:
Carolina Costa Araújo, Medical Computing and Instrumentation Engineering, IPP, Portugal
Juan Elias Pena Luque, Mathematics, IFAP, Brazil
Yuri Farias dos Santos, Control and Automation, IFAM, Brazil
Naiara Hassan Coutinho, Advertising, IFAM, Brazil

Tales Alves Júnior, Biological Sciences, IFAM, Brazil

Description:

Team 6 received the sub-challenge "Sharing knowledge tool in the schools of the Conservation Units". As a result they developed SAPOPEMapp, a platform for sharing challenges between communities for sustainable practices. The project was developed with counterparts from Sustainable Amazon Foundation (FAS).

The proposed challenge is based on the need to assist teachers and educators in the insertion of regional themes in the classroom, highlighting elements and values of the local culture and proposing solutions for sustainable development. Therefore, the development of data sharing app/tools for levelling knowledge and subsequent scheduling strategy for other remote areas can significantly strengthen the training centres for young people/teenagers in remote areas of the state.

Figure 16 – LAPASSION@Manaus teams working at distance and online during the beginning of the pandemic

Figure 17– Team members of the subchallenge proposed by FAS

3.2 LAPASSION@Goainia

LAPASSION@Goiania was held by Federal Institute of Goiás (IFG), in Brazil. As referred before that students' projects started in presential mode and due to the coronavirus pandemic situation were converted to distance/online development. With the main challenge of "How to contribute to a Sustainable and Inclusive Society?" sub-challenges have been launched by different entities like the enterprises Bela Vista (Diary products), and Ecológica (Solar Energy and Air Conditioning), and the municipalities of Goiania and Senador Canedo.

Subchallenge: Generation of Energy by means of Body Movement
Counterpart: Municipality of Goiania
Team members:
Juuso Hakanpää, Nursing, TAMK, Finland
Maxmiliano Frey Moreno, Industrial Engineering and Inofrmation Technologies, PUC, Chile
Danielle Rodrigues Melo, Civil Engineering, IFG, Brazil
Gustavo de Souza Ferreira, Electrical Engineering, IFG, Brazil
Karlla Aparecida Ribeiro, Biology, IFG, Brazil
Description:
The team received the sub-challenge "Use of devices that lead citizens to practice physical exercises and generate Electrical Energy from Body Movement". The counterpart was the Goiania Municipality. As result, it was developed the hardware to test the concept of Energy generation from a Bicycle and an app to deal with social aspects, different modes of operation, and rewards.

Figure 18– Team members during the beginnig of the Project (pre-covid period)

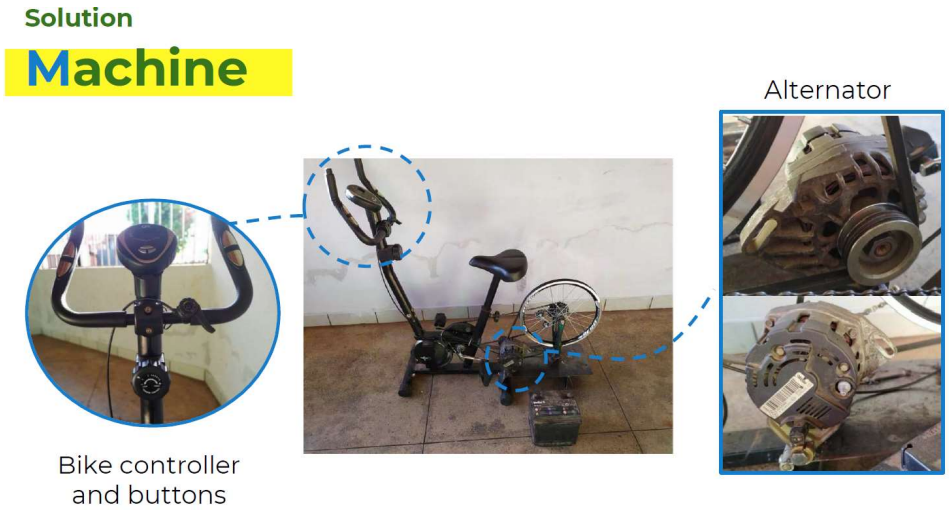

Figure 19– Prototype of the Bike with controls, alternator, and battery

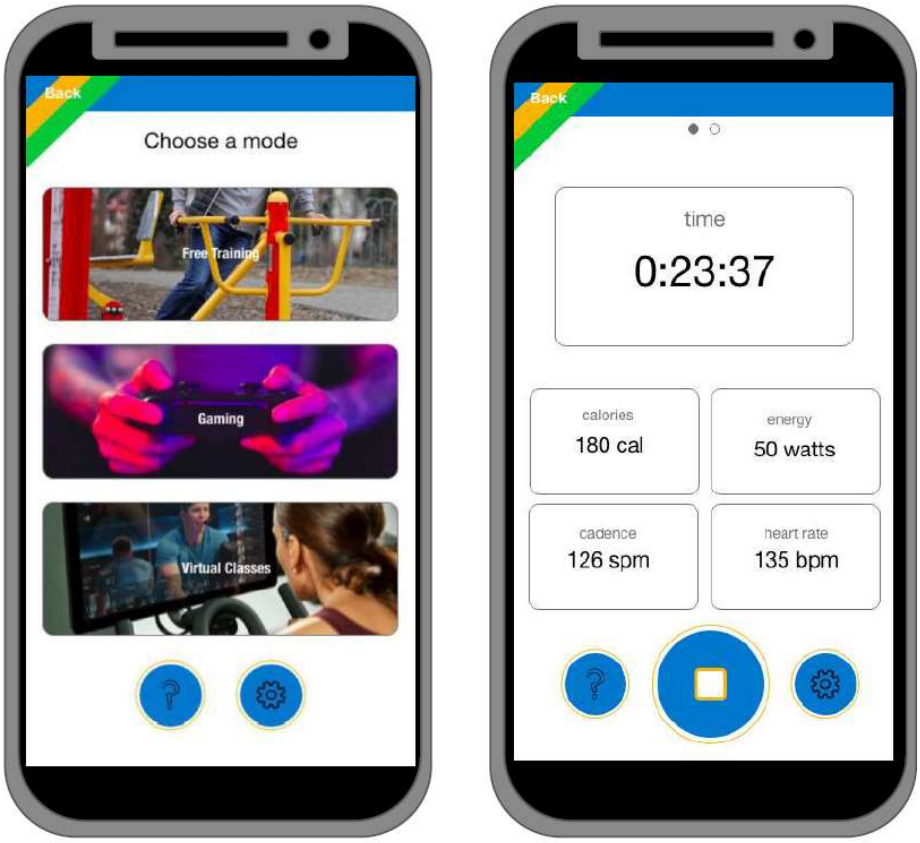

Figure 20– The developed app

Subchallenge: A model street for accessibility for people with disabilities or specific needs
Counterpart: Municipality of Senador Canedo
Team members:
Hannes Töysä, Nursing, TAMK, Finland
Carla Silva, Industrial Engineering and Management, IPP, Portugal
Ademar Lopes, Portuguese Language, IFG, Brazil
Nelson Rodrigues Silva - Electrical Engineering, IFG, Brazil
Beatriz Torezani Sacramento - Sanitary and Environmental Engineering, IFES, Brazil
Description:
The team received the initial sub-challenge "Use of technologies to improve urban mobility for people with specific needs". The counterparts were the Municipal Traffic Superintendence of Senador Canedo and Senador Canedo Municipal Secretariat for Education and Culture. As result, the team developed technology for the Street Ademar de Barros in the Senador Canedo city. An example

is the app for bus stop to inform people in different ways about buses considering different specific needs. The team worked also in an Educational Programme and in a Social-Cultural event to inform people about the changes and how to create empathy with people with special needs.

Figure 21– Team members during the beginnig of the Project (pre-covid period)

Figure 22– Ademar de Barros real street

Figure 23– 3D modelo f Ademar de Barros Street proposed by the team

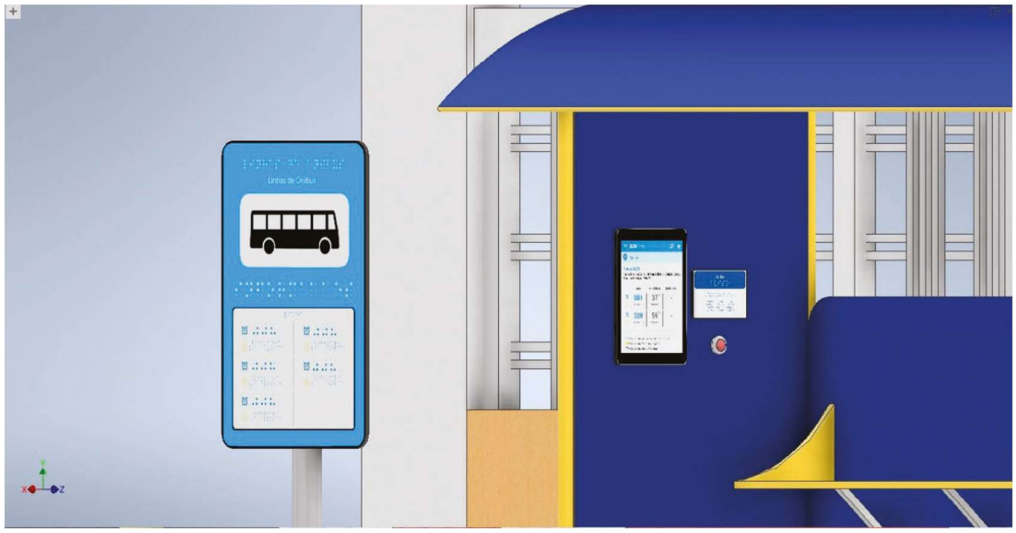

Figure 24– Inclusive Bus Stop proposed by the team

Subchallenge: Enhancing Tourist visibility through the improvement of physical and digital signaling of tourist points of interest

Counterpart: Municipality of Senador Canedo

Team members:

João Matos Guimarães, Medical Computing and Instrumentation Engineering, IPP, Portugal

Araceli Jazmín Sánchez Cortés, Tourism and Hospitality, DUOC, Chile

Gabriel Vieira da Silva Alves, Transports Engineering, IFG, Brazil

Matheus Monteiro Cabral, Electrical Engineering, IFG, Brazil

Sandro Ribeiro, History, IFG, Brazil
Aline Cristina Moraes Ferreira, Architecture, IFMG, Brazil

Description:

This team received the initial sub-challenge "Development of Sustainable Solutions that improve Urban Mobility for the improvement of Tourism and Leasure in Senador Canedo". The counterparts were the Municipal Traffic Superintendence of Senador Canedo and Senador Canedo Municipality. As result, they developed an application to support Tourism and Leasure in Senador Canedo city. A proposal of Touristic Signals and routes has been developed. With this project they expected to create a conscience of the capabilities of Senador Canedo for Tourism and Hospitality, to increase the frequency of visits to the city, the sense of security, the creation of an autonomous Economy, in conclusion a new mindset for the opportunities.

Figure 25– Team members during the beginnig of the Project (pre-covid period)

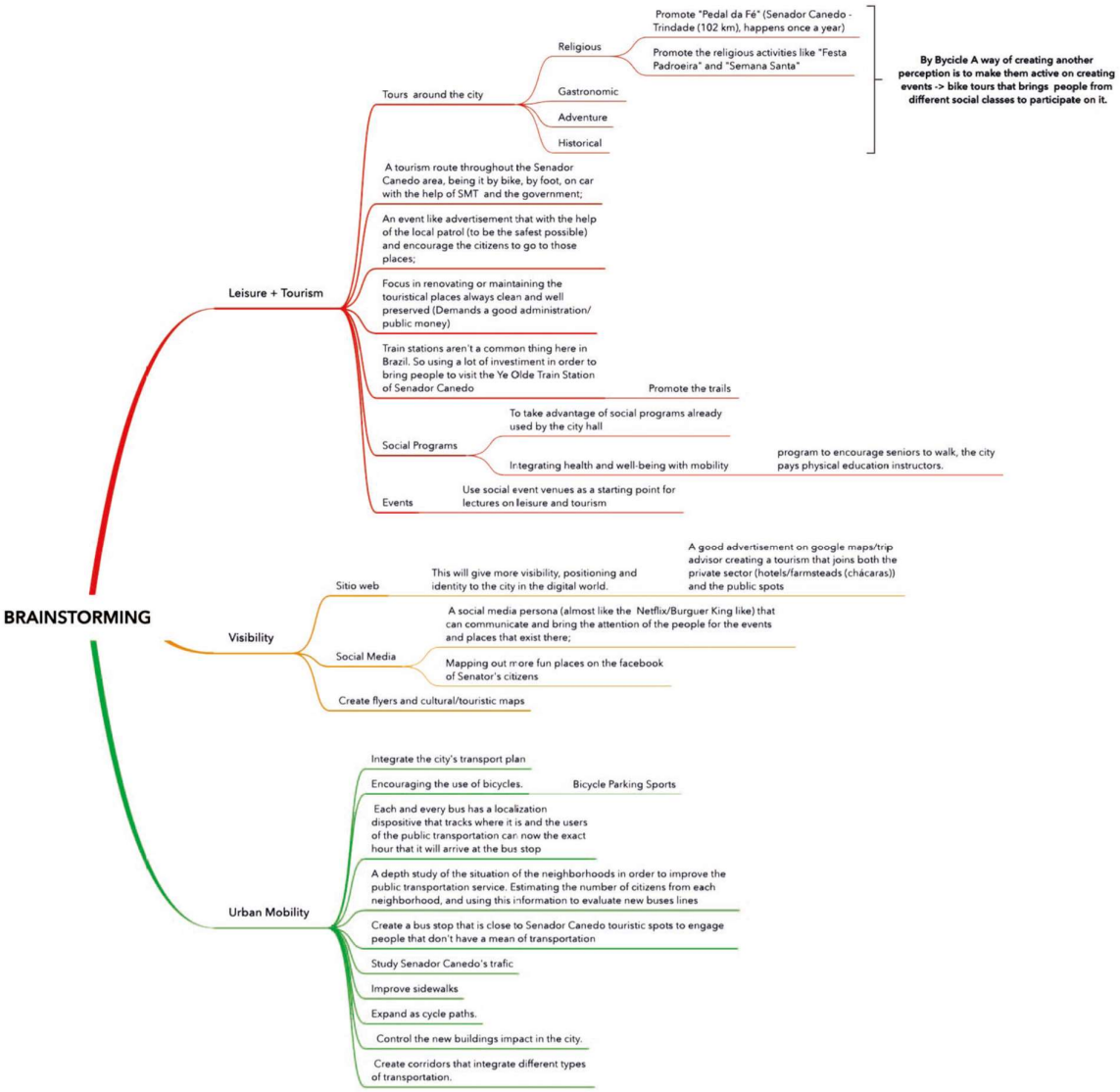

Figure 26– Ideation Tree

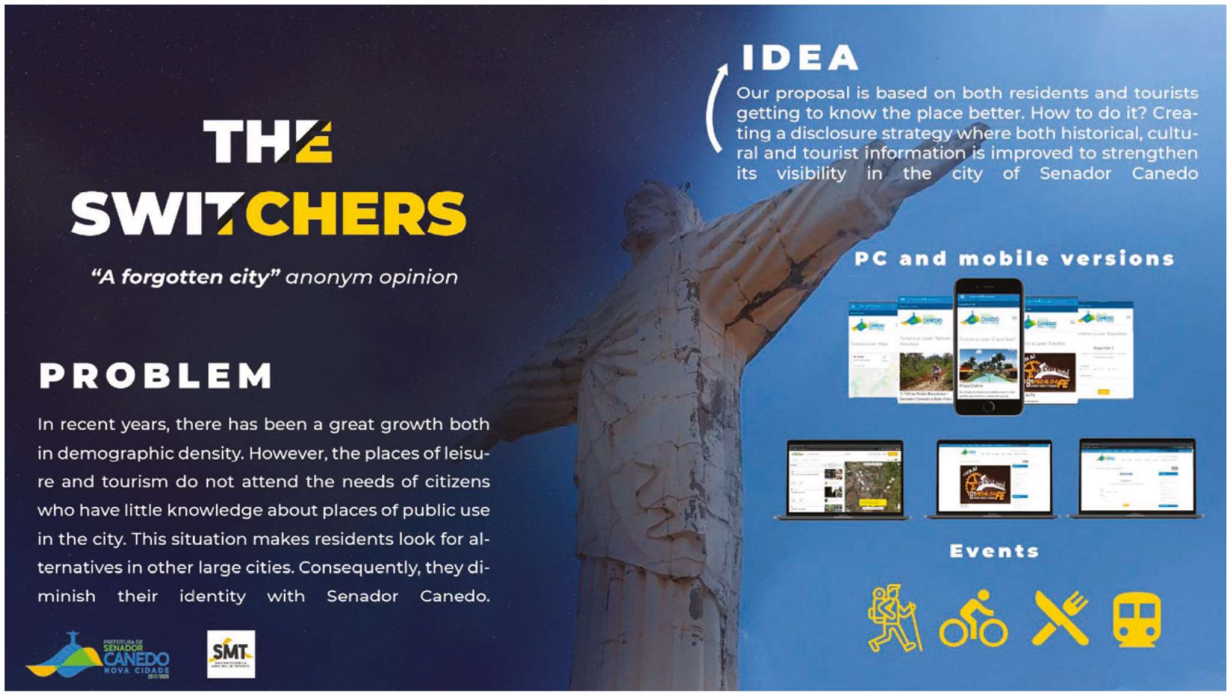

Figure 27– Ideas written on a Cannes Board

Figure 28– Adventure tour suggested by the system

Subchallenge: Reverse Logistics of post-consumption waste of a diary industry
Counterpart: Bela Vista Lacticínios Lda.
Team members:

Carolina Iglesias, Industrial Design, DUOC, Chile
Gabriel Camargo de Jezus, Agronomy, IFTM, Brazil
Gabriel Santos Novato, Civil Engineering, IFG, Brazil
João Eduardo Marques Costa, Control Automation, IFG, Brazil
João Paulo Dos Santos Rodrigues, Chemistry, IFG, Brazil

Description:

Team 4, received the sub-challenge "Use of Reverse Logistics of Post-Consumption Waste from Dairy Industry". The counterpart was the Lacticínios Bela Vista, a dairy company. As result, the team developed a campaign based on Reverse Logistics, starting by people awareness to correct solid waste dump, namely for dairy product packaging. This campaign places information in the packing of dairy products and use information technology to support people for correctly placing the solid waste of the packing.

Figure 29– Team members during the beginnig of the Project (pre-covid period)

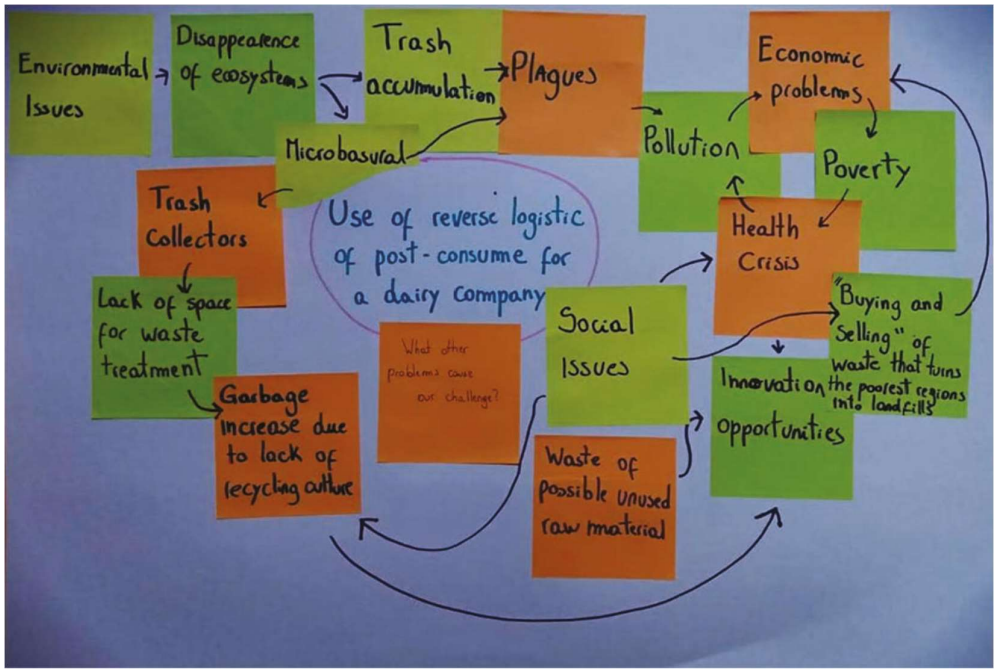

Figure 30– Analysing the problem with post-its

Figure 31– Prototype for the milk carton

Subchallenge: Canadian well integrated biodigester for climate control of poultry and pig breedings with additional electrical energy generation

Counterpart: Ecológica

Team members:

Urania Donoso Guzman, Civil Engineering, PUC, Chile
Fernando César Ferreira, Agronomy Engineering, IFTM, Brazil
Cilas Carvalho Silveira, Sanitary and Environmental Engineering, IFG, Brazil
Valmir Gonçalves Campos Neto, Chemistry, IFG, Brazil
Larissa de Oliveira Aragão, Environmental Management, IFRJ, Brazil

Description:

This team received the initial sub-challenge "How to achieve a sustainable culture of swine and poultry with a focus on sustainable production of electricity and environmental sustainability". The counterpart was Ecológica, a company oriented for Environmental problems. The project involved to specify the process that goes from the waste of organic matter till the use of the generated energy. It involves a Biodigester that converts organic matter in biogas, and by burning the methane gas it is possible to produce electricity, but there is the problem of carbon dioxide. Thus, the purification of the biogas makes sense, and microalgae are used in a photobioreactor for this purpose. In this way it is obtained methane and biomass. Additionally, it is provided the reduction of the energy use for the thermal comfort of the animals by means of a Canadian well. Thus, it was obtained a solution that is environmental friend, providing energy efficiency and it is unexpansive.

Figure 32– Team members during the beginnig of the Project (pre-covid period)

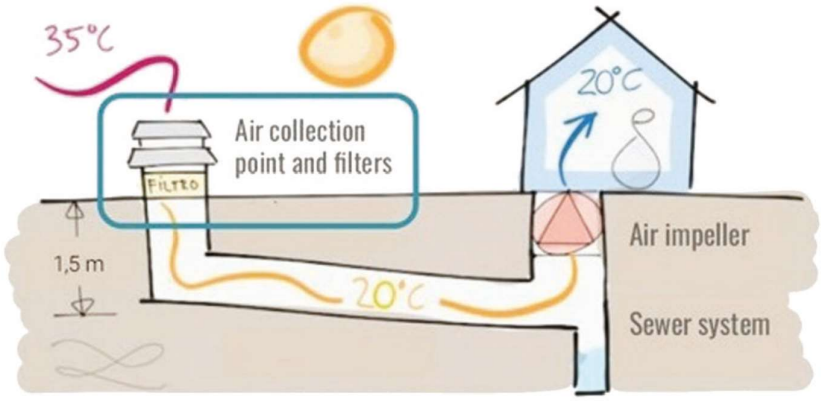

Figure 33- Functioning of the Canadian Well

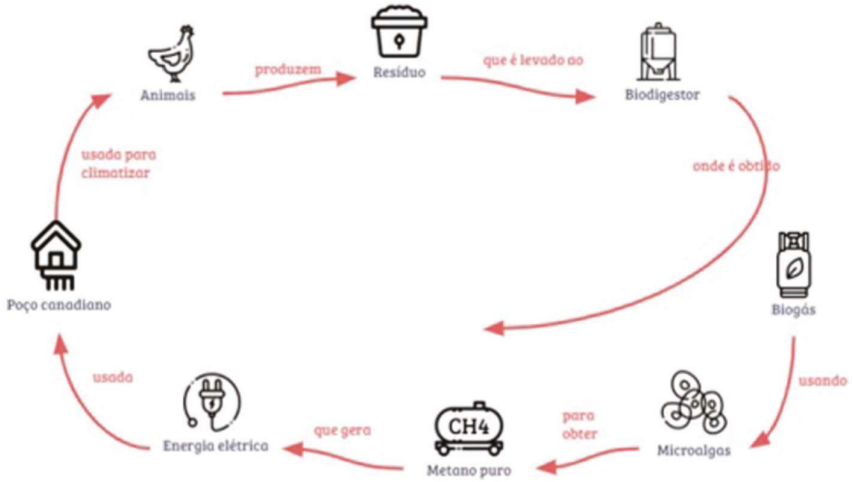

Figure 34– Proposal of the sustainable cyclic system

3.3 LAPASSION@Pelotas

In November 2019, the preparation meeting for LAPASSION Pelotas was held. At that time, LAPASSION Pelotas was scheduled to take place face-to-face, starting at the middle/end of March 2020. Due to the pandemic, travel between countries were not allowed, several activities in the countries were interrupted and the on-site activities in IFSul were suspended and, consequently, Lapassion Pelotas could not start on the planned date. Lapassion project was postponed due to the duration of mobility restrictions and the use of face-to-face spaces. In the case of Lapassion Pelotas,

it started in September 2021, but remotely. A new training week, now in online format was necessary, since the project was decided to run completely online. This training took place in the middle of 2021. Counterparts have been identified, involving Enterprises, Associations, the Municipality, and R&D groups. The counterparts were the following: APL Saúde Pelotas (Association of Enterprises in Health Sector); Pelotas Municipality; Holy House of Pelotas; Freedom (an enterprise that manufactures wheelchairs); and R&D groups of IFSUL, University of Pelotas, and IPP. The main challenge was "Accessibility and Inclusive Technologies".

In this edition of LAPASSION besides students from the partners of LAPASSION we had students from the following partners: Federal Institute of Paraná (IFPR); Federal Institute of Rio Grande do Sul (IFRS); Federal Institute of Santa Catarina (IFSC); University of Pelotas (UFPel).

LAPASSION@Pelotas started on September 1st, 2021. Notice that considering the usual 10-weeks experience of LAPASSION students the end of the project is previewed to November 5th, 2021, 20 days after the end of the international LAPASSION project. But this is not a big problem since no costs a dependent of that, since students of this edition had not fellowships for the travels and stay. Anyway a Pre-Demo Day was scheduled for October 14th, 2021, the last day of the international project.

Figure 35– Opening Cerimony of LAPASSION@Pelotas on September 1st 2021

Subchallenge: Thinking the way to build sidewalks
Counterpart: Pelotas Municipality

Team members:

Enzo Timote, Logistics, UTEC, Uruguay
Fellipe Carvalho Araújo Costa, Electronics, IFSC, Brazil
Jênifer Thaís Graebin, Chemical Engineering, IFRS, Brazil
Martita Browne, Design&Innovation, PUC, Chile
Matheus Monteiro Cabral, Electrical Engineering, IFG, Brazil
Osvaldo Santos, Aquaculture Engineering, IFPR, Brazil
Sergio Márquez Sánchez, Informatics Engineering, USAL, Spain
Thaís Possebon, Civil Engineering, IFSUL, Brazil

Description:

Sidewalks in Brazil are missing in many roads, and this is a big problem for people with difficulties in locomotion, for example in wheelchairs. Thus, the main problem is to have a cheap solution for sidewalks that are missing. The problem involves the price, legislation, and users. The solution found by this team involves prefabricated blocks with sustainable materials, and the management of the process of acquisition and construction of the sidewalks. The blocks combined reused plastic with concrete, and the material has been tested in different compositions till achieving a feasible solution for the blocks. The design was adopted to make easier the connection of different blocks.

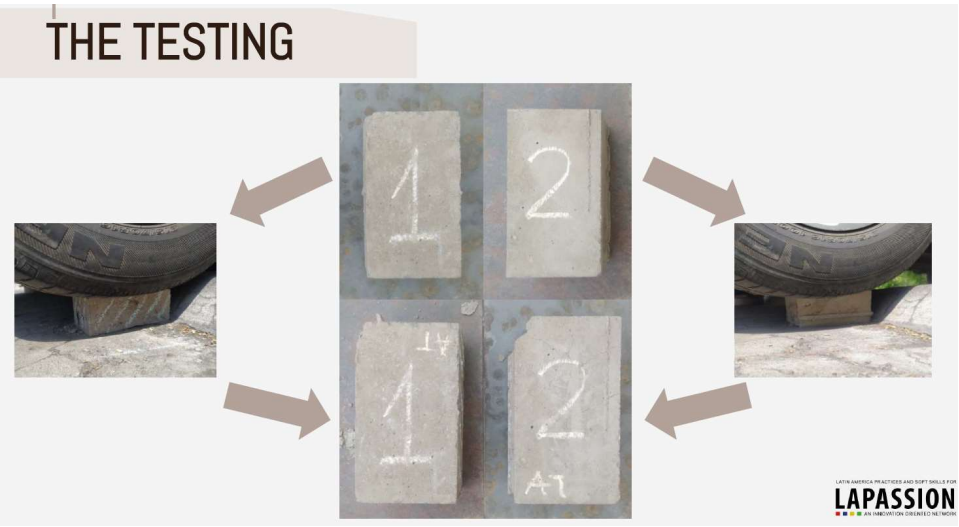

Figure 36– Testing the blocks

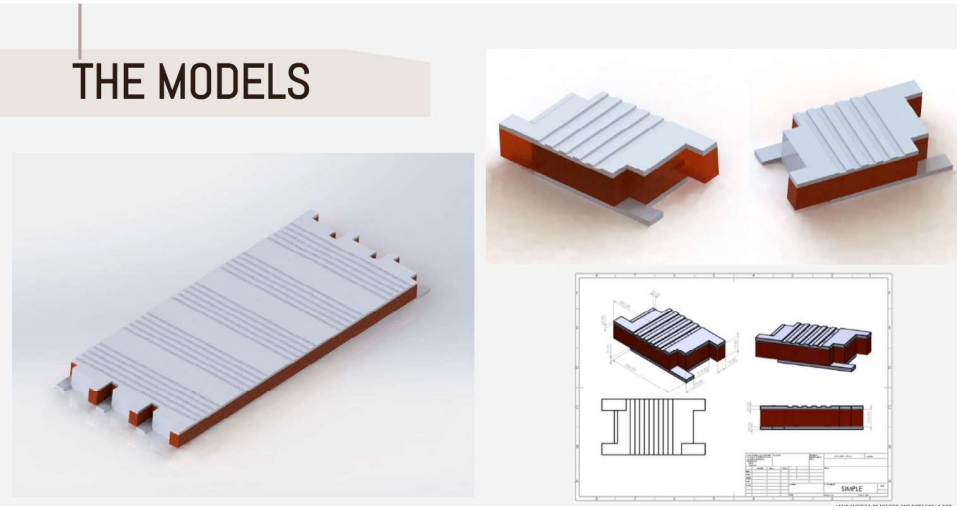

Figure 37– The Design of the blocks

Subchallenge: Supporting tourist with disabilities to move in a Smart City
Counterpart: University of Pelotas
Team members:
Dara Elisa dos Santos Bandeira, Architecture and Urbanism, UFPel, Brazil
Francisco Pinto Santos, Informatics Engineering, USAL, Spain
Manuel Alverdi, Civil Engineering, PUC, Chile
Mariana Karkow Bones, Chemical Engineering, IFSUL, Brazil
Maylon Pereira da Silva, Electrical Engineering, IFG, Brazil
Paula Gonzalez, Industrial Design, UDELAR, Uruguay
Samuel Wachholz, Electrical Engineering, IFSUL, Brazil
Stéphanie Sampaio Dallagnol, Electrical Engineering, IFPR, Brazil
Description:
People would enter the App and use it to notify other users of things like protests, metro/omnibus lines not working, crowding, missing or uneven sidewalk. In addition, the app would highlight places of interest based on filters that the user has placed. In addition, the community will contribute with information, such as safety, accessibility, amenities, and curiosities.

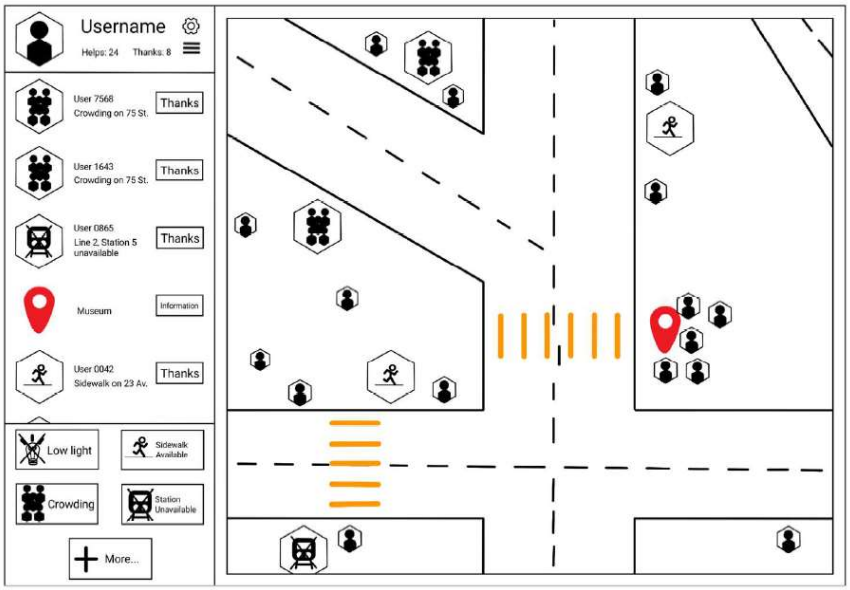

Figure 38– The Mockup of the main screen of the application

Subchallenge: Which is the best way for user to determine their motorized wheelchair ?
Counterpart: Freedom
Team members:
Alexander Vicente Gómez, Informatics Engineering, USAL, Spain
João Henrique Riboli, Portuguese Language, IFPR, Brazil
João Victor Cirino Aguiar, Electrical Engineering, IFTM, Brazil
Lisiane Corrêa Gomes Silveira, Education, IFSUL, Brazil
Marcela Mota, Design, IFSUL, Brazil
Raquel Ordóñez Tobío, Children Education, UVIGO, Spain
Rithiele Gonçalves Araújo, Architecture and Urbanism, UFPel

Description:
It is important to understand that this sub-challenge is about people, not about wheelchairs. The team proposes a complete tool that aims to identify the needs of wheelchair users through the construction of a profile with the help of research instruments, tutorials, and graphic feedback. The basic operation of the MyWay tool is to select the wheelchair better adapted to the user needs.

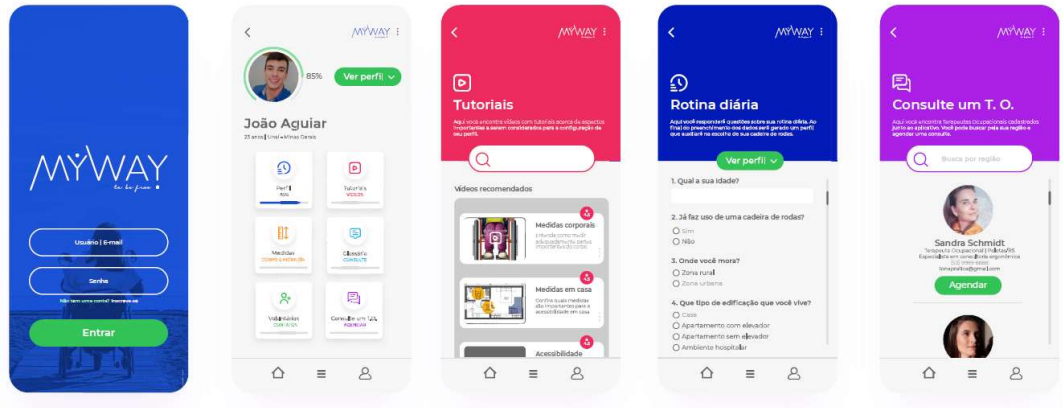

Figure 39 – MyWay is a tool to help in the selection of the most adapted wheelchair for the user

Subchallenge: Develop an interface that makes Casarão 8 Museum a sensory experience for people with disabilities

Counterpart: University of Pelotas

Team members:

Anelize Souza Teixeira, Architecture and Urbanism, UFPel, Brazil
Carlos Martin de Arribas, Informatics Engineering, USAL, Spain
Cristiana Rocha, Biomedical Engineering, IPP, Portugal
Leonardo Oliveira Tiago, Marketing, IFTM, Brazil
Marcos Fernández, Design, PUC, Chile
Matheus Rodrigues Funari, Portuguese Language, IFPR, Brazil
Oscar Schmitt Kremer, Electrical Engineering, IFSUL, Brazil

Description:

This team has as sub-challenge to develop an interface that makes Casarão 8 Museum a sensory experience for people, considering its historical value and heritage for the identity of the city of Pelotas. The team made interviews with people from 25 associations for people with disabilities. Activities of the Museum were not planned for people with disabilities. Tactile models, 3D models, virtual replicas were analysed. But people with disabilities do not want to go alone, or talk with robots, human contact is important. The creation of a multiplayer game for mobile phones that uses QR codes to initiate the interactive experience. QR codes, Augmented Reality, Audio player, and apps are technologies to use.

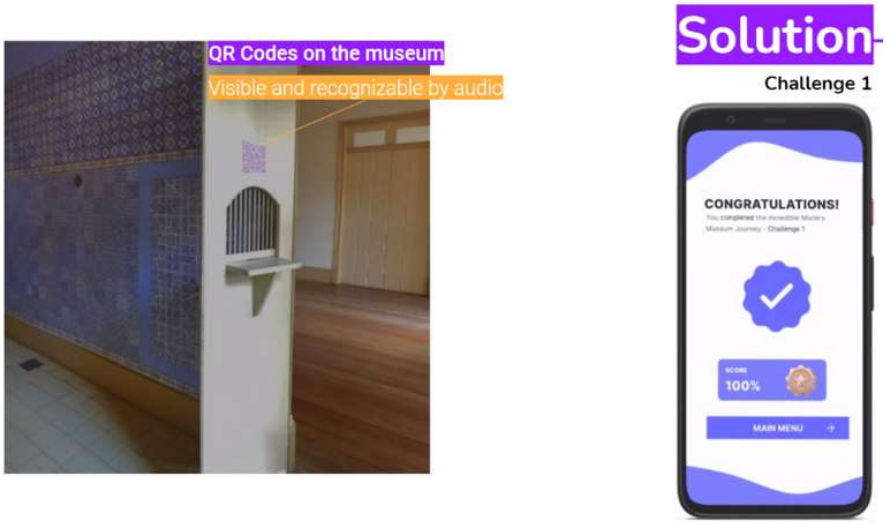

Figure 40 – Combining technologies to help people with disabilities in the Museum

Subchallenge: Development of a digital tool for Hospital-Patient interactivity
Counterpart: Holy House of Pelotas
Team members:
Alexandre Weingartner, Viticulture and Oenology, IFSUL, Brazil
Alisson José Barrabarra, Information Systems, IFPR, Brazil
David Alvarez Caneda, Education, UVIGO, Spain
Herbert Marçal Rodrigues, Electrical Engineering, IFSC, Brazil
Inês Martins, Biomedical Engineering, IPP, Portugal
Julia Soares, Design, IFSUL, Brazil
Sanjay Ramchandani, Informatics Engineering, DUOC, Chile
Silvia Leticia dos Santos, Portuguese and English Language, IFRS, Brazil
Description:
This team has as sub-challenge to develop a tool for the interaction between the Hospital and the patients. It is important to maintain a digital communication channel between the hospital services and patients namely for long-term stays.

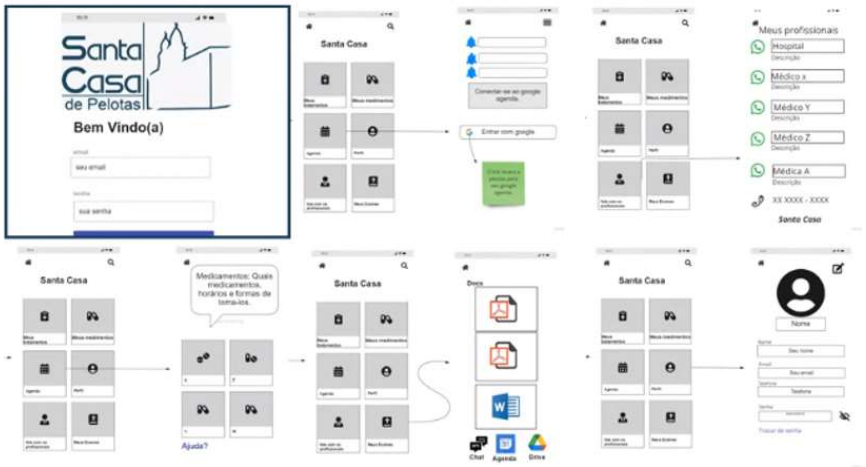

Figure 41– The viw of the application to establish the contact between the Hospital and the Patient

Subchallenge: An Auditorium for Everyone
Counterpart: Federal Institute Sul-Riograndense
Team members:
Ademar Batista Lopes SAntos, Portuguese Language, IFG, Brazil
Anandha Dewes Escobar, Architecture and Urbanism, UFPel, Brazil
Eron Yamamoto Della Justina, Electrical Engineering, IFPR, Brazil
Gabriela Silveira, Biology, IFSUL, Brazil
Livia Cava, Design, IFSUL, Brazil
Luis Blázquez Miñambres, Informatics Engineering, USAL, Spain
Teresita Corthorn, Civil Engineering, PUC, Chile
Description:
The Auditorium is an important place in Higher Education Institutions. Is the place where several events are organized, and accessibility is always a question. Usually there are solutions for wheelchair access, but usually they are not adequate or with simple and safe use. On the other hand, there are other people with problems of disability. Thus it is important to consider different specific needs (hearing, walking, vision) for helping people in participating in the activities of the Auditorium. This team has proposed two solutions. The first is a kind of elevator to move someone in a wheelchair to the main floor of the Auditorium. The second is a device to connect with a mobile phone to help people with vision specific needs, like tritonopia.

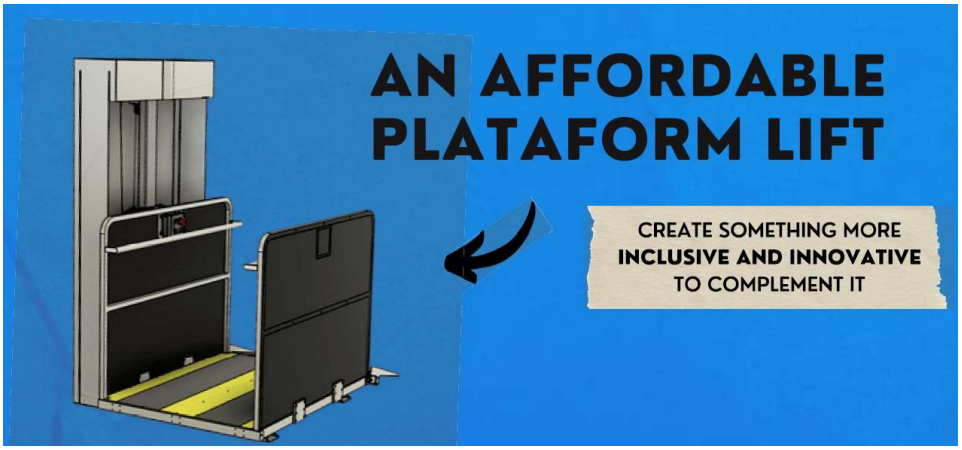

Figure 42– Elevator to help moving people with wheelchairs

Figure 43– Device to connect with mobile phone

Subchallenge: Assistive Technologies for Diabetes
Counterpart: Polytechnic of Porto
Team members:
Ana Catarina Lopes Antelo, Artificial Intelligence, IPP, Portugal
Bruno César Jantarada Teixeira, Artificial Intelligence, IPP, Portugal
Diego Dutra Sampaio, Electronics, IFMA, Brazil
Edgar Simão da Mota e Silva, Artificial Intelligence, IPP, Portugal
Francisco Romeu da Costa Neto, Mechanical Engineering, IFMA, Brazil
Hernâni Azevedo da Silva, Artificial Intelligence, IPP, Portugal

Vitória Maria Serafim da Silva, Pedagogy, IFSUL, Brazil

Description:

Diabetes had an accelerated increase from 188 million of patients in the 80's to 422 million nowadays. Diabetes can be treated, and its consequences dissipated with diet, physical activity, medication, and regular analysis. However, Diabetes is the main cause of Blindness, Kidney failure, heart attacks, strokes, and lower limb amputations. Prevention is important to avoid these problems. This team proposed a family of solutions involving several AI technologies, like multiagent systems, machine learning, and computer vision to help patients with diabetes. On the other hand, a hardware solution has been proposed for insulin injection as a function of blood glucose value as well.

Figure 44– AI technology used to help patients with diabetes

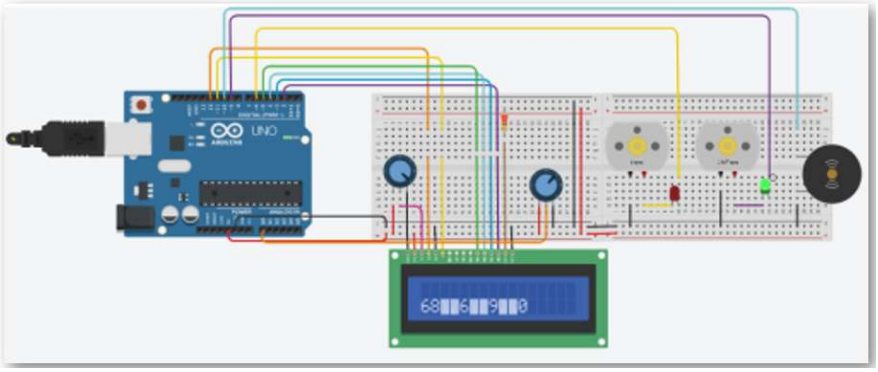

Figure 45– Hardware to control the injection of insulin according to glucose

4. CONCLUSIONS

One of the most surprising achievements of LAPASSION was the ability to convert from one day to another a presential set of students' projects in a complete online/distance experience when the coronavirus pandemic appeared: it is like to change the wheels' tires with the car in movement, in a certain moment LAPASSION was the only academic activity running in IFAM and IFG on March 2020 when the coronavirus crisis impacted the world. The results of LAPASSION@Manaus and LAPASSION@Goiania were amazing, considering all constraints imposed to the students' teams to develop the work in remote/online mode. When we compare the quality of the solutions of these 2 editions with previous editions the quality of the results is quite similar, showing that it is possible to think into a combined set of projects, part presential and the other part at distance.

Excellent results have been achieved in LAPASSION@Pelotas as well, developed in 2021 completely in remote/online mode. However, when comparing the motivation of students in Manaus and Goiania, held in 2020 with 2 or 3 weeks presential and the other weeks online due to the pandemic, with Pelotas, completely developed online, we found that a difference in the teams motivation as a whole is clear. But it is important to say that we were satisfied with the excellent results of the final projects of Pelotas, but we recommend online as part of the students' projects and not for all the project life cycle.

In these 3 editions we noticed the combination between projects developed to enterprises (Caloi, Transire, Samsung, Bela Vista, Ecológica, and Fredom) with projects developed to organizations, namely Secretariats of States Government and Municipalities. Certain Foundations and Associations have been involved as counter parts, like some academic institutions.