

Cross-cultural Engineering Project

Date	Place	Partner Organization	Students' Major and Grade	Participants' Information	SIT Instructor
July27 ~August05,2020	Japan	Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa King Mongkut's University of Technology Thonburi Suranaree University of Technology Chiang Mai University UCSI University Universidade do Minho Universidad de Navarra University of Vigo Instituto Federal de Educação, Ciência e Tecnologia do Maranhão	Systems Engineering and Science Global Course of Engineering and Science Department of Machinery and Control Systems - Undergraduate 4th grade - Master 1st grade	(SIT) Students 8, TA 4, Professor 5 (Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa) Students 10, TA 3, Professor 1 (King Mongkut's University of Technology Thonburi) Students 4, Professor 1 (Suranaree University of Technology) Students 2 (Chiang Mai University) Students 2 (UCSI University) Students 10 (Universidade do Minho) Students 1 (Universidad de Navarra) Students 2 (University of Vigo) Students 1 (Instituto Federal de Educação, Ciência e Tecnologia do Maranhão) Students 1	HASEGAWA Hiroshi(Department of Machinery and Control Systems) WATANABE Dai(Department of Machinery and Control Systems) MANO Kazunori(Department of Electronic Information Systems) YAMAZAKI Atsuko(Department of Information and Communications Engineering)

The collage features two main presentation slides. The left slide, titled 'DORE - Reinventing Recycling', is a business plan for a mobile app. It includes sections for 'BACKGROUND' (Why recycling?), 'OBJECTIVES' (1. To promote recycling around the world, 2. To ease the recycling process through mobile application), 'PRESENT STATUS AND NEEDS', 'REQUIREMENTS' (1. Mobile application, 2. Partnership with companies), and 'CONCLUSION'. The right slide, titled 'Perfect Mask for the New Normal', addresses the problem of wearing masks in a pandemic. It asks 'How can we solve it?' and 'How is that possible?'. It introduces a 'Perfect Mask' that is reusable, environmentally friendly, and can be monitored via an app (SMARTWATCH) and SpatialChat. The slides also mention 'YOU CAN USE IT EVERYWHERE' and 'FDR 2020.08.05'.

Image1 The final presentation

CEP (Cross-cultural Engineering Project) has been held at three sites around the world. This year, CEP@FCT/UNL was conducted as a cyber-physical PBL. It is the course on innovation creation, which consists of design process and prototyping process. Its participant becomes 44 people is consisted of 41 students from Portugal, Spain, Thailand, Malaysia, Brazil and Japan, and three participants from Japanese companies. In the design process, the design specification is defined through the contradiction solving using the QFD matrix. Its matrix is created by the deployment among the required quality from the objectives and needs, the Kando quality through the Kando understanding process and initial solutions. The prototyping process is creating a prototype using the renewed specifications through a design review. This year, since it's web-based, the goal's deliverable as a prototype becomes a business model. For preparing an environment similar to behavior of an ice-break in reality, the SpatialChat, which allows for real-time idle talk and movement in the virtual space, was introduced. Furthermore, we attempted to share the virtual space as a place for cyber-physical PBL by using VR technology. This was a Google Meet distribution using a webcam and microphone, as well as a private distribution of 360-degree camera VR images via the Blinky channel of Alpha Code, Inc. We were able to realize the sharing of space and communication with CEP@FCT/UNL's participants.

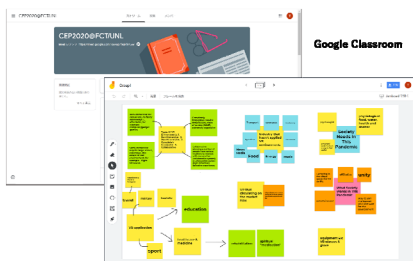


Image2 Google Classroom



Image3 The VR private distribution

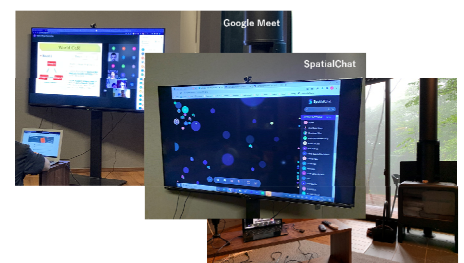


Image4 Web based on PBL

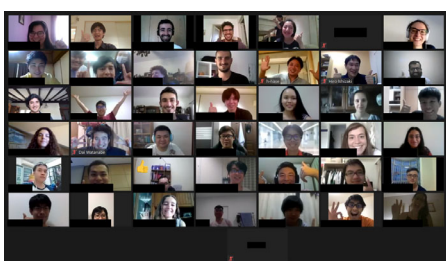


Image5 Participant photograph