ONLINE EDUCATION: TEACHING IN A TIME OF CHANGE

• Paper / Proposal Title:
Developing Student Confidence in Online Low-fi Prototyping through an Online IDEO Design Sprint

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• Abstract (300 words):
The updated engineering undergraduate programs at the University of Exeter include a Multi-Disciplinary Group Challenge Project. This student centered module was designed with principles of IDEO and Gold Standard Project Based Learning (GSPBL) and facilitates the application of core engineering theory to a real-world problem.

Individual student preparation was planned through online resources and f2f interactive tutorials on research skills, technical communication and 3D modelling. Iterative prototyping was essential to the project starting from sketching and building up to card modelling, 3D printing, laser cutting and blue foam modelling in the maker space. Asynchronous project collaboration was planned using Mural with templates for research, ideation and video capture of the prototyping process.

The switch to online delivery due to the pandemic required adaptation of making activities to online prototyping. The academic team combined Zoom and Mural for a week long Design Sprint, putting the project into context, taking students through the IDEO design process online and allowing them to practice online prototyping techniques for their main project. This process of Mural ice breakers, ideating and sketching solutions to demonstrate ideas in low risk, non-assessed activities, built students confidence in creativity, failing fast techniques and online collaboration. Teams were supported through the process of low fi prototype development via Zoom and Mural PBL Support Sessions using personal 3D printers, simple household materials and iterative testing and
refinement. Students excelled in this environment and teams met socially distanced to combine prototype sections and test their complete prototypes.

As future professional engineers, our students will be required to work effectively within multi-disciplinary teams on complex and challenging projects. We believe this online collaborative prototyping experience has deepened their learning to highlight and overcome the challenges faced during international collaboration for global engineering projects and provided an appreciation of time zone and cultural differences.

• Author(s) Biography (200 words each):

Avalon Cory
Avalon is a Lecturer in Design and Project Based Learning and Exeter University. She is an experienced design educator and has design industry experience which she applies to her modules. She has worked with leading sustainable design brands across the UK, established and ran a successful design micro-enterprise, has presented her work internationally and won an award for innovation.

Avalon leads the Multi-Disciplinary Group Challenge Project as part of the updated undergraduate Engineering programs, where she has worked with colleagues to incorporate GSPBL to develop students 21st Century Skills. She is passionate about utilising digital technology for education to improve student experience and is committed to the creation and delivery of vibrant design and practical learning experiences through GSPBL. She is applying her previous experience to manage a new Engineering Maker Space where she plans to co-create a vibrant, collaborative community space to be used by students and the wider community to innovate and make.

Corrina Cory
Corrina is a Chartered Engineer and Edupreneur with over 20 years' experience in education, engineering and entrepreneurship. As Co-Director of Education (Strategic Curriculum Development), her educational research focusses on Gold Standard Project Based Learning (GSPBL) and EntreComp to prepare graduates for the 4IR so they can adapt to rapidly changing technology, develop 21st Century Skills and apply entrepreneurial competence to solve complex problems.

She wants her students to become talented technology innovators of the future and is involved in the digital transformation aspects of the education strategy at the University of Exeter. She is striving to optimise the use of technology in both the delivery and content of modules to improve digital literacy.

Corrina both proposed and is leading the design and construction of the new maker space in Engineering, which will be the largest maker space on campus by 2022. This effective learning environment is a key factor in our vision of 'Engineering the Future' and
facilitating learning through design thinking, early prototyping, programming and improving inclusivity by making STEM more accessible to female students.