

Design education for sustainability: Promoting a circular economy and increasing environmental awareness through the upcycling of plastic waste

Keywords

Circular economy, Design for sustainability, Practice-led learning and teaching, Sustainability education, Upcycling and Recycling.

Plastics are found everywhere, mainly because of their convenient and versatile characteristics and affordability, often surpassing traditional materials. However, these extraordinary features are also responsible for the emergence of a massive, persistent, and ever-growing amount of plastic waste, disrupting the health of our planet. This project, highlighting discourses about design education for sustainable development, offers students the opportunity to investigate the plastic waste problem in a hands-on and empowering way. Our university's city campus alone uses around 60,000 milk bottles a year, close to 2.5 tonnes of HDPE plastic, just from milk used in the cafes, schools, and staff rooms. This valuable resource is currently shipped off-campus to be recycled into lower value products (downcycled). In the circular economy project presented here, we ask 3rd-year industrial design students to design desirable, feasible and viable products made from the university's waste material, the plastic milk bottles. Students use the design process and design and sustainability tools to gain theoretical knowledge through their creative practice. They first research the problem and its context, after which they start generating (product) ideas while simultaneously exploring the HDPE material and possible solutions to reuse it on site. Students are encouraged to experiment extensively with the milk bottle plastic. The aim is to subsequently design innovative products taking advantage of the discovered properties and qualities of the material while also considering user needs and viable manufacturing methods. The design outcomes are envisaged to be used by university staff and students, to be recycled again at the end of their lives. Tertiary

design education for sustainability is more efficient if it is experiential, and raising environmental awareness in students increases through practical learning experiences involving open-ended enquiry. This assignment engages students through project-based learning using an iterative design process, encouraging them to pursue meaningful issues. It focuses on promoting curiosity and exploration, experimentation and intuitive making, problem-solving and change-making, within the themes of recycling and circular economies. The assignment requests students to implement their knowledge and thinking into practice, creating a critical awareness of the impact of plastics on our lives and the environment, and also its value. Students extensively explore the technical, sensorial, and expressive qualities of the material at hand, with 'making' and intuition as the driving forces, which later informs their design proposals. They are encouraged to create innovative change-making solutions, turning the assignment into a positive and memorable experience, aiming for long-lasting behavioural change. This brief aims to teach sustainability in an empowering way to arrive at better learning outcomes and design solutions while promoting a circular economy at the university. The assignment raises awareness about the harms of plastic in a community that lives immersed in it and brings about creative and innovative solutions. The relevance of this project lies in promoting environmental consciousness in students and making the impact of actions tangible by using a project-based and hands-on design approach. Education is used to move towards a more sustainable world by raising awareness in those envisaged to help shape it.