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The Design Compass: Evaluating a New Tool for Sustainable Product Design with Students.

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When developing new products, or improving existing designs, tools such as the Life Cycle Design Strategy (LiDS) wheel (Brezet and Van Hemel, 1997) and the Okala Ecodesign strategy wheel (Okala 2012), are used by designers to explore opportunities to reduce environmental impacts across the life cycle of the product. For global sustainable development, the 'Three Pillars of Sustainability' (Brundtland, 1987) highlight the need to consider the interrelated social and economic impacts as well as environmental impacts.

This paper reports on the development and evaluation of a new tool – The Design Compass (Figure 1) – that helps to navigate these three interrelated issues simultaneously. The tool is for individuals, teams, and organizations engaged in bringing a physical product to market. It has been developed by B-Corp design consultancy, Bang Creations, in partnership with product design academics at Falmouth University and the University of Chester. The tool is comprised of three circular layers that represent design for social, environmental, and economic sustainability. Each layer is segmented into six questions designed to provoke, challenge, and inspire the development of sustainable design concepts, whilst providing actionable guidance on how to address the challenges.

The economic layer (top) of the tool investigates what is needed to bring a successful product to market. Here the focus is on critical business strategies relating to customers and manufacturing. The environmental layer (middle) prompts ecodesign strategies that can be considered across the lifecycle of the product. Examples include exploring energy consumption, material selection, durability and repairability. The social layer (bottom) probes the meaningfulness of the product and the value it can bring to society. Here the focus is on inclusivity, equality and social justice.

The tool is unique as it has three distinct uses: providing a structured framework for learning sustainable design strategies; generating innovative ideas through question alignment across its three layers; and benchmarking design concepts against industry best practices. The three layers can be used independently to focus on a specific sustainability issue or used in combination with each other. The circular layers are designed to rotate so numerous combinations of three questions (relating to social, environmental and economic sustainability) can be explored together. This feature of the tool reveals the tensions that can exist between business priorities and the needs of people and planet.

To gather feedback on the usability and effectiveness of the Design Compass, the tool has been integrated into taught modules on undergraduate product design courses at Falmouth University and the University of Chester. The students used the Design Compass to support the development of product design concepts that engage with the circular economy. This has included collaborative opportunities for students from both institutions to work together. Qualitative feedback has been used as part of an evaluation process to continue to develop and improve the Design Compass. It's value as an educational tool has been demonstrated with an expectation that it will provide professional designers with a powerful tool to engage with sustainable design strategies at a holistic level.