

# ORGANIC DESIGN EDUCATION FOR CIRCULAR ECONOMY

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*PAPER ABSTRACT: This paper reviews desired factors and systemic influences to cultivate a thriving setting for organic design education to prepare design students for a circular economy. It reviews faculty-driven initiatives adopted in a sustainable and social impact design studio where aspects of the organic educational setting were integrated. The paper concludes with the final results of these practices.*

Keywords: Circular economy, design education, education for sustainability, sustainable design and manufacture.

## 1. INTRODUCTION

In this delicate world we live in, leaving a cleaner, and more equitable future for generations to come means we need to make the change within ourselves first, and collaborating better and more effectively with others. The “Circular Economy” concept is a new way of designing, producing and using products sustainable within our planet’s boundaries. This new vision allows us to create a thriving economy while restoring our natural resources. By shifting from a linear and compartmentalized system to a one where we keep product and materials in use, re-generate natural systems, and design out waste and pollution, we open up new possibilities for a sustainable and thriving economic future (What is Circular Economy, n.d.). The Covid-19 pandemic has shown us once again that we all have to work together to overcome global challenges, and that our interconnectedness as a human race stretches beyond silos and national borders. This crisis has not only accelerated the urgency of working collectively for a sustainable and thriving economic future, it has also made educating the next generation of designers who can design for circular economy ever more important and relevant.

Educational institutions urgently need to re-design and stay relevant to these rapid shifts by providing democratic access to a design education, and allowing for a more organic, inclusive learning process. How can we effectively foster divergent thinking, encourage collaboration, and apply individualized learning to our studio teaching for the circular economy when we are still operating within the same educational institutions that are established from the linear thinking and information silos we seek to deconstruct?

This paper will describe how circular economy relates to design education, highlight key desired factors that impact a culture of learning, and provide select initiatives in an existing educational institution lead by Başak Altan in her design studio. The study shows how this transformation in providing design education for circular economy can manifest itself in a learning context.

## 2. CIRCULAR ECONOMY AND HOW IT RELATES TO DESIGN EDUCATION

The design profession plays a key role in the shift from a linear industrial to a circular economy. What makes designing for a circular economy challenging is the very fact that it is an integrated and complex vision that requires the collaboration of many stakeholders and entities, such as businesses, governments, consumers, cities, products and services (Figure 1).

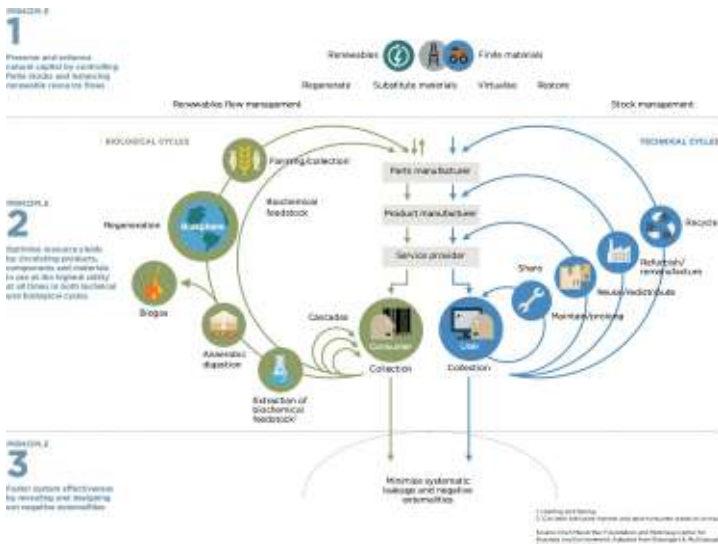


Figure 1. The Butterfly Diagram (Ellen Mac Arthur Foundation, 2015a)

With the recent challenges in our global economy our educational institutions, along with many other entities, had to change their normal way of operating. This necessity forced institutions, their directors and their faculty to operate in new ways gifting a unique opportunity to rethink the way we provide design education, and industrial design. This shift in operation can be toward restructuring from a system rooted in the principles of the industrial era, toward a more organic, better connected educational system, preparing future designers who are globally-minded for a new paradigm of designing for a circular economy. How we design our educational experiences directly impacts the design students' desire and ability to exercise critical and creative thinking, and thus creating relevant products and services imbued with meaning and offering a positive impact on society.

We can do this better by bringing the complex and increasingly changing real world practices into the educational space through transforming the design studio so it transcends boundaries, disciplines, and departmental silos. This requires shifting away from the traditional studio lecture style towards an organic setting which facilitates freedom and safety for students to critically think, empathize, create, test beyond the physical attributes of their concepts while developing the strategic foresight of how their solutions may

interface and evolve with the organic system in which they operate. This type of learning can only be done in high functioning, non-hierarchical and highly collaborative group settings with full immersion in the real world topics explored.

## DESIRED FACTORS AND SYSTEMIC INFLUENCES TO CULTIVATE A THRIVING SETTING FOR ORGANIC DESIGN EDUCATION FOR A CIRCULAR ECONOMY

To address the complex challenge of designing for a circular economy an industrial design education studio, the educational setting needs to integrate the following aspects:

- The design curriculum should be organic. It should be flexible, and open to advancement of the profession in order to not only meet the minimum current needs of the workforce but also foster a thriving innovative educational journey (Do Schools Kill Creativity, n.d.). It should be open to challenging the norms of the design profession as well as be flexible to work with individualized interests of design students. It should bridge the gap between different departments and disciplines to foster meaningful collaborations to support these initiatives.
- The design curriculum should connect design students with mentors and field experts. This is a crucial missing link between design education currently and the professional design world and needs to be implemented at the right time within the development of students' projects. Design students and the projects they work on benefit greatly when there is easy access to the expert's critical feedback during their investigative journey. This important connection allows them to discuss the reality of their offering, validate their hypothesis, and improve their designs with strategic feedback. It also fosters lifelong connections that allow designers to bridge the gap of their academic career to their professional careers. Currently these critical connections with multiple professional mentors are often faculty-initiated and self-driven, and only by those who are well connected in their professions. Design internships are great opportunities for real world practices but often fall short of what a continuous, strategically assigned meaningful mentorship might look like.
- The design institutions should lead by example. Fostering an environment where design students and faculty can thrive starts with a setting that values social equity and social impact. We first need to demonstrate the value for design and its education within the confines of our educational institutions by walking the walk. Successful educational organizations that value design and design education for a circular economy not only market this philosophy, they also practice and demonstrate this value internally in the way they operate and interface with their stakeholders. This integration of value stretches beyond emphasis on bottom lines of running an educational business but also extends to advancing their student and faculty's value through offering living wages, creative opportunities for advancement, and reward systems that connect the circular loops back to the goals of a sustainable design education. Common practice for most educational institutions is to operate by relying

heavily on short-term adjunct faculty and graduate students who are given little incentive to stay, helping the institution build a strong culture and knowledge base. This does not demonstrate a sustainable educational model, and often falls short in demonstrating positive social impact and social equity in the design community they operate in (Facts About Adjuncts, n.d.). This larger systemic problem of undervaluing design educators at the epicenter of design institutions warrants an urgent re-thinking of the educational system, so that these systemic factors do not continue to contribute heavily to the under valuing of our design profession, its education, and its connection to the professional organizations and beyond.

- The student base must be diverse. Diversity is the key to richness of thinking in collaborative groups that studio teaching relies on to advance design education thinking. This is increasingly undermined by a selection process that is contingent upon those who can afford to pay tuition to get into most design schools, as well as foreign policy dictating who can get access to educational visas from abroad. This process directly impacts the perspectives and experiences that inform design student's exposure to different modes of thinking as their fellow collaborators represent a less diverse group to collaborate with and exchange new ideas with when compared to a more organic and democratic educational model where representation from across all segments of society can access this space.

### **3. TEACHING ACTIVITIES DESIGNED FOR A CIRCULAR ECONOMY**

In the Social Impact and Sustainability studio at California College of Arts Industrial Design Department, taught by Başak Altan, fourth year industrial students were asked to work on tangible design solutions while focusing on facilitating social change for the circular economy. The first half of the semester exposed the students to examples of sustainable frameworks within the context of designing for a circular economy, in the latter half of the semester students worked on team projects using practical tools and techniques for identifying issues, developing solutions, troubleshooting problems in their designs.

The overarching goals of the studio were threefold:

- First, the course covered fundamentals of designing for a circular economy, sustainability and social impact by building an understanding, awareness, and comfort using sustainability criteria and frameworks.
- Second, to design resilient, long-lasting value driven experiences that are restorative by design. The students were tasked with demonstrating their understanding of the business context that their solutions lived in.
- Third, was to practice team collaboration, presentation, design, and critical thinking skills.

Teaching activities of the organic studio included the following:

- Student-lead design research plans: In this studio, the design teams were asked to design their own design research plans, and present progress of their findings and

evolution of their team concepts weekly. This process relied heavily on the students' ability to enquire independently and conduct on-site research with users, continuously revising their plans based on findings, and sharing their progress during the collaborative studio sessions where their studio mates and expert mentors provided critical feedback to their projects (Figure 2,3).

- Social Impact and Sustainability Analysis: During this integrated studio, students were asked to consider their solutions within the larger context of the global environment, and society by demonstrating their understanding of the tools, materials, methods and concepts that they were introduced during the coursework by applying the appropriate methodologies to their projects (Figure 4, 5). The hands-on application of these tools allowed them to adjust their design research and reframe the problems, as well as gain a better understanding of their users, and the business landscape they are operating in. This resulted in projects offering solutions that have meaning and cultural resonance as well as positive social impact.
- Business Canvas Assessments: To be able to design for circular economy effectively the student teams needed to understand that design process is an integral part and a large portion of the business plan creation ranging from understanding the drivers of value creation, to customer segments, and relationships. With this in mind, the design students were asked to demonstrate their understanding of these important connections in their projects as well as how their role as designers impact and offer circular opportunities in organizations (Figure 6).
- Expert Professional Mentors: Connecting the link between design education and professional network are mentors. They enhance the educational quality beyond the studio. This team was assigned a professional mentor whose interest was aligned with their research topic. This pairing allowed the team to deliver professional concepts that were grounded in business reality. The evolution of their prototype was improved through involvement of their mentor Nishat Rustagi, Founder of Make's feedback, who was then a part of the jury team at the end of the semester for Team Axo (Figure 7).

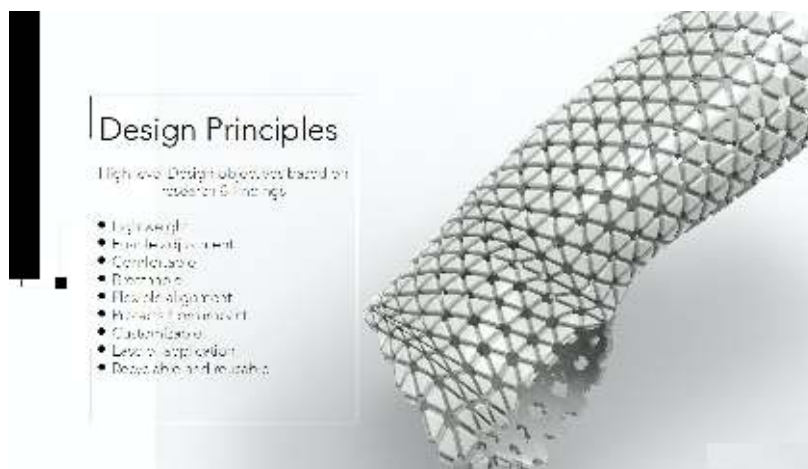


Figure 2. High Level Design Objectives Based On Student Research Findings and Testing Of A Flexible Cast System By Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng For Basak Altan's Fall 2018 CCA ID Studio.



Figure 3. Iterative Rapid Prototyping Based On Research, By Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng For Basak Altan's Fall 2018 CCA ID Studio

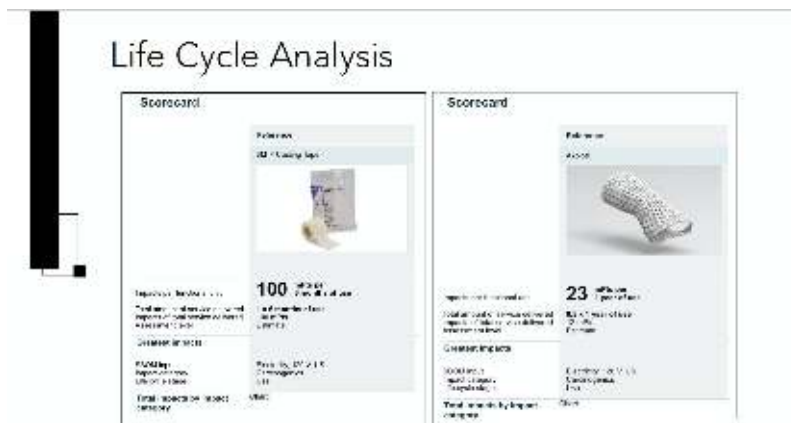


Figure 4. Life Cycle Analysis Comparing Standard Casting Tape To The New Concept By Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng, For Basak Altan's Fall 2018 CCA ID Studio

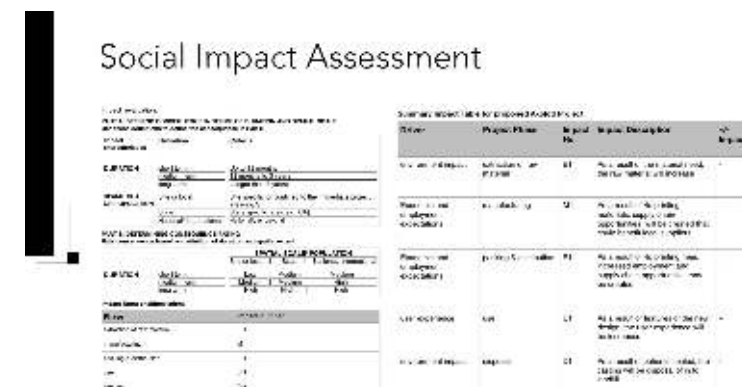


Figure 5. Social Impact Assessment Of Student Concept By Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng, For Basak Altan's Fall 2018 CCA ID Studio

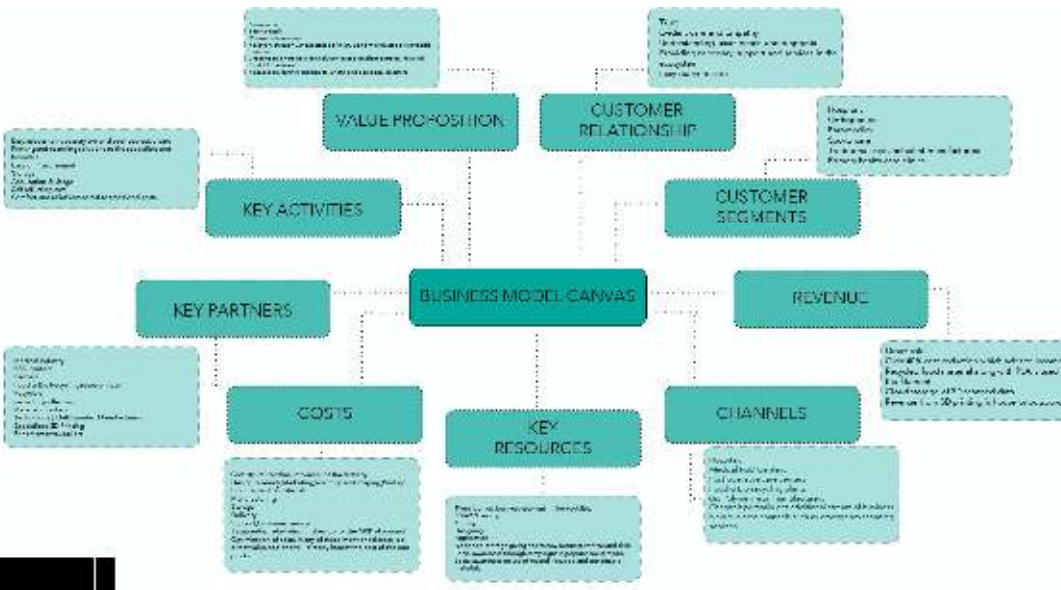


Figure 6. Business Model Canvas That Shows The Integral Connections Of Their Business By CCA ID Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng, For Basak Altan's Fall 2018 CCA ID Studio



Figure 7. Student Team AXO, Aadhya Krishna, Tri Duong, Jerry Zheng's Final Model Developed With Professional Mentor Nishat Rustagi, For Basak Altan's Fall 2018 CCA ID Studio

## 4. CONCLUSION

We aimed at fostering designers for the circular economy. The design education initiatives taken by Başak Altan, in her design studio at CCA Industrial Design Department resulted in internationally recognized, pioneering and award-winning product designs by students.

The social impact and sustainability studio included four design teams. The faculty led teaching activities facilitated a setting to create an organic studio within the existing educational system. The topics presented by four student teams were driven by collective team interest. All of the design teams integrated their findings from the business canvas into their solutions and were able to impress and convince the jurors of the new value in their offerings within the circular economy. Of the four teams, three demonstrated their openness to continuous divergent thinking, and incorporated the collaborative input into their designs. Through this they were able to create innovative solutions pushing farther than their initial investigations of their subjects. Out of the four student teams, two teams won international design awards- a gold for social impact, and a bronze for sustainability in student categories. This can be seen as an indirect validation of the teaching methods used for the purpose of shifting design education for circular design successfully.

In this case, shifting the conditions within the existing educational system to foster an organic studio relied on individual faculty who acted as the change agent. Here, the studio collaborated with outside agents in the business and technology world not only to enrich the educational experience but also to expose to designing for a circular economy. This shift to organic studios can be greater when guided by visionary academic leadership who endorses the value of creating strategic partnerships. This change is already happening.

In conclusion, to remain relevant, educational institutions must transform into organic organizations to be a part of the circular economy.

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