Application of Biodesign Framework and Principles in Public Space

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Extended Abstract

Biotechnology's global impact presents a unique opportunity for designers to integrate biological principles into their practice (Myers, 2014). In Mexico, there is a growing recognition of the need to formally educate designers in biodesign. This abstract explores the educational strategies used to nurture Mexican design students into biodesigners.

Inspired by scholars like Donna Haraway and Donella Meadows, this document advocates for a paradigm shift towards multispecies collaboration, known as the Chthulucene (Haraway, 2016). Biodesign, in this context, goes beyond material choices to embrace a holistic understanding of ecosystems and collaborative creation through the chiasmic experience of environmental sympoiesis.

As biotechnology expands into sectors like consumer products and energy, biosemiotics emerges as a theoretical driver for creating meaning (Kohn, 2013). This approach emphasizes communication with our environment and creating meaning together with other species. This research provides an initial exploration of the biotechnology-design relationship, outlining key concepts and methodologies. After working on diverse biodesign projects with Mexican students, this research will go deeply into the applications of bioluminescence in public space.

By fostering interdisciplinary collaboration and deepening the understanding of biology and design, educators can prepare students to navigate biotechnology complexities and contribute to a more symbiotic human-nature relationship (Davis, 2023).

The students' projects demonstrate the application of biodesign in public spaces, emphasizing the importance of understanding local context and societal needs.

Students at UAM are invited to embark on a journey of reimagining public spaces through biodesign. Beyond merely incorporating natural elements into their projects,

students explore the intricacies of natural systems, including resource sharing, collaboration, and co-creation, similar to the symbiotic relationships between mushrooms and tree roots (McCoy, 2022). By embracing these principles, students can create innovative solutions that harmonize with nature and actively contribute to the resilience and vitality of urban environments (Ejido Villareal, 2004).

This process will not only provide valuable insights into the potential of biodesign but also develop a deeper appreciation for the interconnectedness of all living beings.

For this paper, the focus is on a project where a group of students began exploring the applications of bioluminescent fungi in public areas. Their research sparked a growing interest in bioluminescence, leading to collaboration with expert mycologists in Mexico who discovered and named new species of luminescent fungi. Notably, Mexico is the second largest country in luminescent fungi diversity, just after China. The fungi culture is deeply embedded in Mexican culture, contributing to the growth of the emerging field of ethnomycology in terms of interest, numbers, and societal impact. This collaborative project evolved into a comprehensive plan, visualized with stunning AI-generated images, and was presented to key investors in February 2024 in New York City, alongside three other luminescent biotechnologies. If approved, the project aims to develop bioluminescent solutions for city landscapes, parks, bicycle lanes, observatories, and viewpoints. This initiative was inspired by the students' initial desire to participate in the Biodesign Challenge.

As educators, it is crucial to empower students to become catalysts for positive change, shaping a future where human and ecological well-being are intertwined (Salingaros, 2019).

In conclusion, the convergence of design and biology underscores the growing recognition of the value of interdisciplinary collaboration in driving innovation (Antonelli, 2011). The research presented here is part of ongoing PhD research on the potential impact of the Biophilic Creative Industry.

This collaborative spirit fosters the emergence of projects that offer novel forms and functions, pushing the boundaries of traditional disciplinary confines. By transcending these silos, designers, biologists, and diverse creatives can explore new realms of possibility, erasing the epistemological frontiers that once separated their fields.

What ultimately matters is not the specific disciplinary lens through which a problem is addressed, but rather that the root cause of the problem is understood and attended to. A transdisciplinary approach not only embraces diverse forms of knowledge but also liberates individuals from the constraints of their respective disciplines, allowing them to focus on the main objective: addressing the problem and creating solutions to improve the situation.

This approach postulates the need for a radical change in human behavior and a new way of relating to the biosphere. This epistemological shift implies ceasing to perceive the human race as the exclusive administrators of planetary resources and adopting a more integrative perspective, in which we see ourselves as one species among many within the Earth's biome.

This new horizontal relationship between species is fundamental to opening ourselves to the possibility of negotiating with other life forms on the planet.

In this context, the biophilic approach distinguishes itself from other socio-technical-inspired design approaches by placing a particular emphasis on the integration of living organisms as integral components. This enhances the functionality and sustainability of the final product and, perhaps even more valuable, creates meaning together as a multispecies collaboration to fill this world with meaning.

Figure 1. Visualization of Bioluminescence applied to Public Space. (Image credits: Generated in Leonardo.Ai by the student at UAM Mario Alberto Castro Rosas).

Connections references

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