

Rethinking Graphic Design Education to Tackle the Climate Crisis: Repurpose, Reform, Reimagine

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Abstract— *Graphic design is engrained into our products, values, and actions. It has the potential to extend or reverse the environmental crisis through our collective choices: the type of products we make and how we package and transport them, the values we believe in and instill in new generations, and the ideas we turn into experiences. Brian Dougherty [1] states that designers are, on the surface, makers of tangible products; on a deeper level, visual communicators; and at the core, agents of positive change. Taking this viewpoint as reference, this paper proposes a framework that rethinks some aspects of graphic design education in order to tackle the climate crisis in three major steps: Repurpose or re-designing artifacts, Reform or re-designing course content, and Reimagine or re-designing opportunities. Repurpose explores the concept of upcycling packages and designing for re-use with examples from student work in the packaging design class at Zayed University in Abu Dhabi, UAE. Reform draws from existing literature to suggest ways in which values and skills nurtured in educational institutions can be revamped to tackle environmental challenges. Reimagine proposes bringing together various fields of study in experiential spaces designed to educate the community on circular economy. In short, the aim of this paper is to show examples of how graphic design education can contribute to global efforts of tackling the climate crisis by repurposing existing material, reforming course content to prepare individuals to find solutions to the crisis, and reimagining community-based opportunities for social transformation.*

Index Terms: *Graphic design, Education, Pedagogical framework, Sustainability.*

I. INTRODUCTION

Our natural spaces on earth are endangered. With less available landfill space, more pollution, and greenhouse gases getting alarmingly high –much due to high consumerism of products made of harmful components–severe consequences on the health and habitat of living creatures have been observed. Our wellbeing is closely connected to our choices and actions: the type of products that we make and how we package and transport them; the values we believe in and instill in new generations; and the ideas we turn into tangible outcomes.

Graphic design, often associated with merely being the “look and feel” of a visual artifact, has a more substantive role to play. It is deeply engrained into our products, values, and actions. Brian Dougherty from the San Francisco-based design firm, Celery Design Collaborative, compares graphic design to an avocado. He states that, on the surface (the skin), designers are makers of stuff since they utilize physical materials such as paper and ink to produce tangible outcomes. On a deeper level (the flesh), they are visual communicators who seek to deliver impactful messages. Most importantly, at the core (the seed), they can be agents of change when they influence the actions of the audience, clients, and other designers, while striving to improve unfavorable situations.

Throughout its history, design has extracted resources from nature, only to release back in return large quantities of harmful waste. To cite only a few of many alarming facts, “the paper industry is the fourth largest industrial producer of

carbon dioxide, accounting for 9 percent of our greenhouse gas emissions” (Dougherty p. 124), while plastics used in packaging, vinyl signs, laminated papers, and smart cards are packed with toxic chemicals and are often difficult to recycle, ending up overflowing and contaminating our land, water, and air. The resulting issue at hand is then: How can graphic design give back to nature responsibly? There are resources published on the topic, shared by scholars that include Eric Benson, Yvette Perullo, Michelle Fehler, Peter Claver Fine, Wendy Jedlička, Holly Robbins among others, but looking at the fact that green graphic design is still generally considered by the mainstream industry an individual preference rather than an immediate public need, further research and application is evidently needed.

This study takes Dougherty’s viewpoint on design as an avocado, and applies it to the pedagogy of design; proposing a framework for regenerative graphic design education fulfilled through: re-designing artifacts (stuff), re-designing content (messages), and re-designing opportunities (change).

The research methodology is qualitative and consists of case studies from project-based assignments, a literature review of design pedagogies, and self-reflective interviews.

II. REPURPOSE: RE-DESIGNING ARTIFACTS

“We live in an exciting, creative time of transformation, with very big problems that demand solutions [...] In order to design for change, we must change the way we design” (Dougherty p. 184). Packaging has, for several decades, been associated with the ephemeral, especially when it comes to the food industry as Peter Claver Fine [2] explains: “With

nearly 60 percent of all packaging designed and produced for foods and beverages, the waste associated with these products ranks high on the list of ecological issues” (p. 54). How can we then change the way we design packages? The simple answer would be to unpackage products and promote reusable packages [3]. Replacing single-use containers with reusable, refillable, returnable ones can help address the issue from a design perspective.

At Zayed University’s (ZU) College of Arts and Creative Enterprises (CACE), between Spring 2019 and Spring 2021, graphic design students enrolled in the packaging design class AGD 452 explored the concept of upcycling packages and designing for sustainable use through different assignments. All students started with a brief synopsis on the history of packaging and materials utilized, and an introduction to the concept of upcycling through practical exercises. During the pandemic, students collected discarded packages from their home and transformed them into new longer-lasting objects. For example, a student utilized medicine boxes to create a flipper maze and a photo display box, while another student, who was diabetic, transformed a cereal box, delivery box and electronics box into a foldable box to organize her medication for daily use (fig. 1).



Fig. 1. Foldable box for medication by Aisha Salmeen.

Moreover, a chocolate box was transformed into a jewelry box, a box of water bottles was turned into a cardboard bowling game, a cheese box and a medicine box were made into a money bank and a vase for dried flowers, a box of face masks was turned into a miniature foosball, a coffee capsules package was turned to a dispenser of capsules for repeated use, and a digital tablet box was reappropriated as a utensil organizer while its case box was turned to a mailbox and keyholder (fig. 2).



Fig. 2. Mailbox and keyholder by Asma Al Blooshi.

After this exercise, students were assigned readings from Scott Boylston’s *Designing Sustainable Packaging* [4], Anne Chick and Paul Micklethwaite’s *Design for Sustainable Change* [5], Daniel Imhoff’s *Paper or Plastic: Searching for Solutions to an Overpackaged World* [6], Wendy Jedlička’s *Packaging Sustainability* [7], and Peter Claver Fine’s *Sustainable Graphic Design: Principles and Practices* [2]. Each student had a case study or chapter to read, summarize, and present to peers for discussion; to collectively learn about

processes and materials.

Following these two preparatory exercises, students were asked to design personalized and customizable packaging kits that respond to consumer needs (in terms of types of materials and sizes of packages), as well as preferred visual styles. Kits would serve to transport goods such as food, from the market to one’s home, or from home to a picnic outing or to work. The process started with each student finding a client and inquiring about their shopping habits (which items they shop for regularly to determine what kind of packages are needed) and visual taste (preferences in the style of imagery, typography, and color), along with preferred language (Arabic or English or imagery without text). Each student then researched about various material and proposed a visual identity with either physical or virtual prototypes for the client to review (fig. 3 and 4). Based on the client’s feedback, the student modified the design until the client as satisfied. The client then received the kit as a gift.



Fig. 3. Shopping kit for Razan by Noora Al Hajeri.



Fig. 4. Picnic basket by Omaira Al Ghallabi.

The project started as a food packaging kit, but was expanded to include cosmetics or cleaning products, since some suppliers provide dispensers for cleaning liquids, or sell unpackaged cleansing products such as solid soaps (fig. 5 and 6).



Fig. 5. Cosmetic kit by Zahrah Al Marar for her brother.



Fig. 6. Cosmetic kit by Dana Sawad for her sister.

As an outcome from this project, prototypes were produced and provided to the clients, for the intended purpose of reducing their consumption of short-life-span packages. Students were not required to follow up with clients on how they utilized these packages, and as a result it was difficult to assess their usability. To take this further would be to later examine how often and to which extent the clients utilized the kits, especially when both market and consumer habits are dominated by convenience.

When packaging design is redefined as a means to label, protect, and transport contents in a circular manner, it can cease to become an advertising agent, and personal branding could potentially replace product branding. Design can offer solutions, but these can only be thoroughly implemented when supported by policies put forward by the government in favor of reusability and repurposing of existing material, and applied by society's producers and consumers. Contributing members of societies (i.e., consumers, producers, and governments) have a shared responsibility in tackling environment-related issues. One of the ways to prepare for societal transformation is to aim for globally educating citizens about ecology, sustainability, and regenerative design. A growing library of resources is available for educators and students. It includes the Circular Classroom [8], the Ellen MacArthur Foundation [9], the Green Graphic Design course [10], and the recently published guidelines for the implementation of sustainability in higher education institutions [11].

III. REFORM: RE-DESIGNING COURSE CONTENT

Educational institutions that focus on ecology wellbeing, and health as key pillars in the students' education such as the Muse school [12] and Brockwood Park School [13] are only a handful in a mainstream of pedagogical systems that retain inherited goals and practices. Erik Assadourian [14] asks:

"How can we transition away from schools that are based on outmoded ideas or even remote memorization; that feed children unhealthy food and give them just twenty minutes a day to be outside and active; that overwhelm them with technologies for which they are not ready; and 'teach to the test' rather than offer creative opportunities to learn cooperatively, connect with nature, and 'learn how to learn'?" (p. 312)

He attempts to respond to the above issue by proposing alternate approaches to the curriculum:

"If it is designed to be Earth-centric—teaching students to understand their dependence on a living planet and providing them with the skills that they need to live restoratively and to navigate the conflict that life on a changing planet will bring—then they will be better prepared for the tumultuous future ahead." (p. 312)

The United Nations Sustainable Development Goals (SDG), notably Goal 12 *Responsible Consumption and Production* acknowledges that human habits are root causes of the climate crisis. Although excessive consumption and production are known to be causing severe damages, we are far from thoroughly educating students on the topic. The SDG 2022 Report [15] reveals through a global survey that "one in four teachers does not feel ready to teach themes related to these topics" [of sustainable development and global citizenship]. The report advises: "more effort is needed to ensure that these issues are core components of national education systems."

The same challenge exists within graphic design education. Rebecca Kelly from Syracuse University [16] suggest reviving the field by deprogramming students and instructors from the traditional *teach to the test* approach, while preparing students for adaptability, collaboration, and entrepreneurship. As outlined by Benson, Jennings, and Gibson [17], American-based design education (which is widely adopted across the Middle East and beyond) "no longer effectively prepares its students to practice design ethically or responsibly given the current socio-economic, political and environmental state of our planet" (p. 131). As such, they recommend that we "teach our students to get beyond the typical, narrowly framed, artifact-based outcomes" (p. 150). Namely, they call for teaching students to disseminate new ideas rather than merely sell products destined for the landfill. In response, institutions such as the University of Illinois and Arizona State University have introduced biomimicry and regenerative design in their design curricula [18]. At Zayed University, a new learning outcome for the graphic design program has been added through which students are expected to: "Interpret principles

and elements of art and design, using visual language and visual communication, *to address social, cultural, or environment issues* within timely local or regional contexts.” On a wider level, a growing community of educators and professionals are sharing resources across the online *climate designers* platform [19]. Various entities are acknowledging the role that design can play in responding to the climate crisis. In 2024, the World Environmental Education Congress (WEEC) added the component of design alongside art in one of its ten themes, in order to “identify and help resolve environmental challenges” [20]. How then, can design education at school and university level be revamped to tackle these challenges?

According to Kelly [16], designers of the future “must acquire a more diffused type of thinking to expand the relevance of their work” (p. 48). Designing responsibly would involve thinking broadly while considering all stakeholders involved. From a spiritual lens, John Chryssavgis [21] asks for reestablishing the lost connection with nature, respecting all creation, and recognizing the interconnection between the natural environmental and human rights.

“The balance of the world has been shattered, and the ecological crisis will not be solved with sentimental slogans or recycling programs.” (p. 123) *“If we are going to effect a shift in our attitude and change our lifestyle in order to regulate or reverse the environmental crisis, we must first of all transform the way we perceive our world and ourselves* (p. 176) [while noting that] *“preserving nature and serving neighbor are inseparable.”* (p. 206)

This calls for re-examining pedagogical systems and establishing priorities that address the planetary crisis, while drawing from research conducted by a multitude of individuals and entities. At York St John University, Susan Orr [22] and her colleagues noted Curiosity, Compassion, Collaboration, Communities, as four aspects to drive art and design pedagogies. Orr asks that priority be given to students’ wellbeing and sense of community. Unfortunately, these values are not always considered when designing products and services. Ann Thorpe [23] explains that because ecosystems and social values do not have a price set to them, they are rarely considered in economic decisions:

“Many important values and resources, such as clean ocean water or diverse languages, are difficult or impossible to price in the marketplace [...], and the result is that we treat them as though they have no value at all. At the same time, the damages caused to these unpriced resources are not measured by the market either. [...] The current approach of letting the market decide that zero market means zero value is a significant barrier to sustainability.” (p. 66-67)

Thorpe calls for preserving values and challenging our current notions of what design is, while examining the relationship of design to ecology, economy, and culture. Similarly, Benson, Sequeira, and Fehler [24] propose life-centered systems thinking “for designers to

compassionately comprehend our interconnected world” (p. 17).

Building up on what the above-mentioned scholars suggest, this paper proposes principles (values), competencies (skills), literacies (topics), and material (resources), that can be incorporated in pedagogical systems to aid this transition. In their study, Benson and Napier [25] observed that by connecting values to design inquiry, their students more successfully integrated the principles of sustainability in their work. Once values are established, skills that support sustainability can be introduced in schools to facilitate their acquisition. Educators of economics and sociology can design their curricula around economic equity and social justice. In addition to pedagogies, resources (such as food consumed at the institution as Assadourian outlined, as well as paper and pencils utilized) cannot be disconnected from the values promoted. Consequently, values, skills, topics, and resources must be cohesive for students to grasp their interconnectedness.

Table I: a tentative list of curricular values, skills, and applications

VALUES	SOFT SKILLS	PRACTICAL SKILLS
Beauty	Adaptability	Cleaning
Compassion	Choice-making	Composting
Generosity	Communication	Cooking
Gratitude	Collaboration	Fixing
Humility	Contemplation	Planting
Love	Creativity	Preserving
Respect	Self-control	Remaking
Unity	Self-examination	Serving
TOPICS	RESOURCES	
Benevolence	Biodegradable	
Biomimicry	Ethical	
Ecology	Organic	
Economic Equity	Plant-based	
Human Body & Spirit	Renewable	
Regenerative Design	Safe	
Social Justice	Unbleached	
Visual Literacy	Upcycled	

Presently, institutions that place earth-centered values, skills, and applications at the core remain limited in number. However, “through talent and innovation, higher education institutions have the potential to lead the change to address the major social transformations that our world needs,” says Victoria Galán-Muros [11] (p. 22). The SDG report [15] proposes a holistic education that is committed to restore and nature, while integrating life-centered systems thinking. In graphic design, this paper calls for a reformed educational system that is founded on ethical human values, that regularly questions the skills needed by tomorrow’s students and the topics it deems as essential, and that carefully reconsiders every resource utilized and re-utilized in production.

IV. REIMAGINE: REDESIGNING OPPORTUNITIES

Efforts to tackle the climate crisis can start in the classroom, and expand. A past project that addressed design and ecology at ZU and that targeted “integration and expansion towards collective well being” is the Kulna social enterprise [26], an action research based on systemic design, that involved collaboration between designers and a multidisciplinary team to visualize and translate ideas into tangible actions and outcomes.

The packaging project aforementioned was repeated at ZU’s Abu Dhabi campus in Spring 2024 with a new group of students. This time, students were asked to conduct more thorough research on their client’s readiness to reusing or repurposing containers. Students shadowed their clients, observing their consumer behavior privately (at home) and publicly (at the market) before proposing design solutions accordingly. The assignment brief was also simplified to focus on designing labels rather than folded paper mockups, so that students would have more time to research, select, and procure the containers before designing their graphics.

Below are selected stories from three students who spent considerable time studying their clients’ behavioral patterns before proposing practical visual solutions.

Shaikha accompanied her client on shopping trips and noticed: the path and sequence of items collected in the cart, the way her client divided her cart, and other behavioral patterns such as the juice she decided to buy on the spot. Shaikha then suggested that a reusable bottle could be taken from home for filling with juice to reduce single-use plastic waste. After the trip, Shaikha observed how her client stores the food at home, and this gave her ideas on proposing containers that could be easily transported and then stored immediately in the cupboard.

The designer then went further to select an artifact with cultural relevance (threaded cotton bags that her ancestors used for collecting pearls when diving) and repurposed it into a mesh bag for solid produce (fig. 7). The bag can be stored outside, (responding to a request by the client) and can be easily hung without needing to move the contents. Typography and visual elements were carefully considered, as is done with any design project, but the choice of material was of no less importance throughout the process, with students thinking more broadly (as advised by scholars in section III above).



Fig. 7. Food packaging kit designed by Shaikha Al Marzooqi.

Maryam started interviewing her client (her mother) in her kitchen, asking her to reflect upon the containers she utilizes and appreciates the most. Her client was already in the habit of repurposing items because she mentioned that she dislikes removing the adhesive residue when repurposing a jar. Maryam now considers adhesive material and mechanisms of attaching a label to a jar in packaging design. After thorough observation to decide upon materials, Maryam wrote:

“The decision to use glass for all components stems from its durability and timeless appearance, as I’ve observed its resilience and enduring freshness in our household over the years. Additionally, I opted for a canvas-like fabric for the string to ensure flexibility and ease of handling. Should my client desire to transfer the olives to a larger container for a special occasion, they can simply relocate the label to the new container, and likewise for the other products.”

This statement reflects a synthesis of long-term observation as well as a desire to preserve the versatility of containers and possibility of utilizing them for different kinds of fillings in the future. To achieve visual consistency, Maryam utilized a traditional Middle Eastern pattern across the labels, and then decided to print it using stencil and paint on the box that held the six containers (fig. 8). The stencil was cut out from an existing piece of upcycled cardboard, showing the student’s creativity in art-making methods that did not require the use of raw material (but reappropriated existing one) for the stencil. When the final packaging kit was at the university campus, Maryam said her client was eager to start utilizing it.



Fig. 8. Food packaging kit designed by Maryam Saif Al Zaabi.

Five months after, Maryam reported upon her client’s use of the custom-made kits, and responded with the following [27]:

“Yes, my mother used the packaging kits. However, she still preferred filling the product at the grocery store with the bags they provide, then pouring it into the glass jars at home. Although she uses the jars, she does not use them in the way we intended because they are made of glass, which makes them heavy when fully filled. Although the paper-making experience was truly one of a kind, my mother is too afraid to use the labels because she’s worried they might rip or be damaged. She believes they are too beautiful to be in the kitchen where they might get ruined.”

The reflection raises a point about the glass jars. When filled, they become too heavy for the shopper. Alternative material can be considered for better usability. Lighter yet durable tin cans or reusable pouches could work for dry contents, while a wooden jar could work for honey. Working with material scientists would be ideal. Printing an extra set of labels for keeping can help solve the dilemma faced by the client.

Reem Alobeidly repurposed material to adapt it to the client’s shopping from the apothecary (for spices and grooming material) and the farm (for fruits and vegetables) (fig. 9). For the latter, she repurposed a jar previously holding a candle; and for the apothecary, opted for lightweight bags and containers.



Fig. 9. Papermaking, printing, and packaging designed by Reem Alobeidly.

Reporting on her client’s response to the kit [28], she said: “Yes, my client has used it regularly, typically on a weekly basis, consistently with her grocery shopping schedule. Several factors have contributed to the kit’s usefulness: Convenience (The kit was designed to be user-friendly, making it easy for her to carry and organize her purchases. Its compact size and lightweight nature have made it a practical choice for her routine shopping trips.), Sustainability (The eco-friendly materials used in the packaging align with her commitment to reducing environmental impact. This made her feel good about using the kit, reinforcing its value), Durability: (The high-quality materials ensure that the kit withstands regular use without wear and tear, a significant factor in her continued use.), and Customization (The kit was tailored to her specific needs, allowing her to store and transport items efficiently. This personalized approach increased her satisfaction and encouraged frequent use). These factors made the packaging kit an integral part of her shopping routine.”

At the prototyping stage, the labels for each of these containers were printed on a limited stock of paper (with each student receiving only two sheets of paper to organize all their labels upon) (fig. 8 and 9). The fiber for papermaking was taken from agricultural waste, as part of Fresh Press Emirates’ [29] first activity, under the guidance of visiting artist Drew Matott. As such, the project in the class evolved since it was initiated in 2019: starting as an exercise in repurposing packages, to become one where students reimagined their means of production as well as their client’s consumer behavior.

The examples above showed how projects were taken outside the classroom and applied to immediate practical situations. Further insights into how a design curriculum, alongside life experiences, can prepare students for environmentally mindful careers, can be drawn from the journey of a former student, Mariam Fahed Al Zaabi [30]. Al Zaabi graduated with a bachelor’s degree in graphic design from Zayed University in 2014. In 2015, she joined the Environment Agency–Abu Dhabi (EAD) as a branding specialist, and in 2018, decided to pursue a master’s degree in environmental studies at Victoria University of Wellington in New Zealand. She returned to EAD in 2020 as an environmental analyst, where she was involved in benchmarking and developing national policies, while also using her design skills to visualize research and communicate policies effectively. More recently, she was appointed as a Sustainability Specialist for the Abu Dhabi Sustainability Group (ADSG), focusing on business modelling with external stakeholders and supporting networking events and seminars.

Al Zaabi’s career illustrates her deep interest in the intersection of design, environment, and sustainability. Her passion for nature, influenced by her choice to become vegan in as a teenager and later a professional cyclist, combined with her design skills, has enabled her to integrate

sustainability into her work. A notable example of her commitment to green graphic design occurred in 2016 when she led the design of materials for the Al Dana Excellence Award organised by EAD, an event attended by approximately 600 participants. For this project, she chose recycled paper with low grammage, used white and light-colored backgrounds to minimize ink usage and enhance recyclability, and opted for digital backdrops on screens and projectors available at the venue.

Reflecting on her academic experience, she acknowledges that her studies at Zayed University's College of Arts and Creative Enterprises (ZU CACE) equipped her with essential conceptual and technical skills in visual storytelling, vital for the social initiatives she later pursued. However, she recalls being surprised by the lack of specific university projects addressing climate issues or the environmental impact of design work. This gap has been addressed in recent years with the introduction of new program learning outcomes and projects that engage with these crucial topics.

Mariam's current goal is to develop a sustainable foods policy for the Emirate of Abu Dhabi, targeting consumers, the food market, and eventually government regulations. Despite working within a governmental agency, she notes the challenges of proposing policies that directly target government entities due to conflicts of interest, making large-scale change more difficult. Even as an insider, she finds it challenging to be creative and proactive within the entity she works for, given the constraints of existing branding guidelines and policies. This underscores the reality that meaningful change is rarely easy to achieve, yet it remains highly necessary and urgent [15].

In her thorough study on service design, Lara Penin [31] explains that services and products are closely related. When discussing the environmental sustainability of services, she states: "At the heart of the environmental question lies the logic of industrial production –on which our whole economic systems are based– largely based on principles that disregard the finitude of global resources and the capacity of the planet to absorb the related impact [...] The need for a broader paradigm shift is clear, and it should consider both production and consumption patterns" (p 130). Penin characterizes service design as strategic, people-centered and focused on well-being, participatory, utilizing material products and systems, and visualized through story-telling. She explains: "design is not only about understanding things; foremost, it is about imagining preferred futures and designing interventions to get there" (p. 151). Since this section builds up from repurposing material and reforming educational systems to reimagining applications of contemporary graphic design, this paper concludes with an idea for the reader to speculate upon.

Imagine, in a sunny Middle Eastern climate, three circular twelve-meter diameter landscapes, placed four meters apart from one another. The first, *Cleanse*, encourages natural homegrown cleansing materials: the toothbrushing miswak,

moisturizing sesame oil, pure cotton, and plant-based loofah. A spiral starting with a miswak tree in its center unfolds with sesame plants, cotton plants, and loofah bulbs climbing on palm stalk sticks and wrapping onto a wire. The second, *Give*, suggests an ecological use of organic waste through a compartmentalized circular compost bin contained in an underground structure. The third, *Play*, promotes safe recreational material with playing dough (wheat flour), plant-based dyes (from beetroot, turmeric, purple cabbage and spinach), a snack (corn on the cob), and picnic material such as mats, hats, and baskets (made from the stalks of palm trees). The *Cleanse* and *Play* circles can include a spiral trail to walk through and admire the beauty of plants that have provided for all the above (fig. 10).

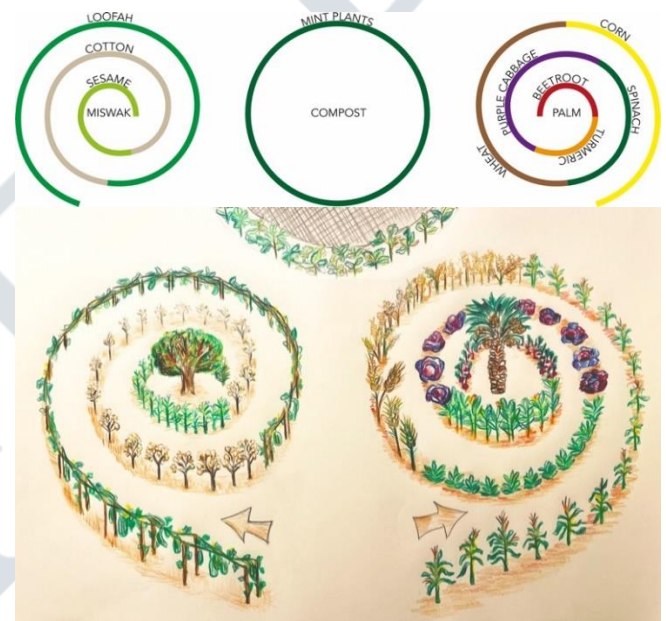


Fig. 10. Imagining a functional public garden: Cleanse, Give, Play.

In proximity to these trails, a series of functional kiosks could be designed for the same purpose. They could include drinking water-filling points (already implemented at select places in the country including beach resorts and farms), a station that collects items for reuse or recycling (implemented by Tadweer at select spots in Abu Dhabi including the Al Bateen recycling station), a dispenser machine for soaps and oils for personal use (exists at some local supermarkets), a registration booth for a compost bin service for home-use (not yet available in the UAE but exists internationally), and a pop-up shop that sells plant-based food coloring and picnic materials.

Currently, single-use synthetic polymer-based products made using the earth's limited resources dominate a large part of the consumer market, and graphic designers are often asked to merely lay out information on a package to appeal on the shelf, and to be discarded shortly after use. When the role of designers is narrow and shortsighted, it is difficult to make real changes that consider regeneration rather than

short-lived consumption. But when life cycle design is driving any venture, with designers ideating *new* ways (or *new twists* on long-standing traditions) of cleansing, giving, and playing, (as imagined above), when destructive materials are replaced with safe alternatives, when governments support policies that drive a green economy, the stage would be set for human habits to potentially change.

V. CONCLUSION

The involvement of design in environmental issues is not new. Anker [32] recalls that the Bauhaus ideals of humans existing in harmony with nature were proposed a century ago and that Herbert Bayer applied these ideals in architecture, land art, and graphic design. Anker adds: “environmental debates are more indebted to artistic communication than their followers have been willing to admit” (p. 271), and with involvement comes responsibility. Consistently with the recommendations made by Dougherty, Penin, and others, this paper proposes that tackling the climate crisis ought to engage graphic design curricula in reconsidering materials utilized in production, reevaluating core academic principles, and reimagining practical applications of graphic design in the service sector. In other words, it calls for challenging graphic design students in approaching the field from a human- and earth-centered angle. As designers are producers as well as consumers, they can be role models in prioritizing the biodegradability and longevity of materials at the design and production stage, while carefully co-designing and re-designing experiences, from production practices to consumption patterns. Through empowering well-rounded and responsible educators, institutions, designers, manufacturers, and consumers; graphic design education can become a powerful agent in building a more sustainable future.

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