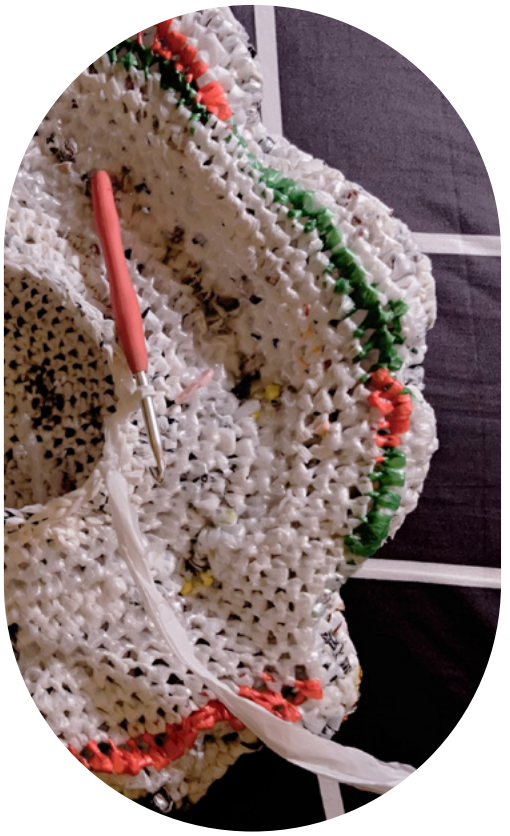


Practice Article

Critically Recycling through Community-Engaged Learning

Marcela Godoy and Diane Geng

Abstract

One of the most critical environmental and social concerns in recent times is the issue of plastic waste and pollution.

While recycling and repurposing are often presented as solutions to this problem, more than simply teaching students how to remake or repurpose plastics is required. This study investigates the effectiveness of the course *Re-Made in China*, designed to enhance student awareness and engagement regarding environmental issues, specifically plastic waste. The purpose of the study is to explore how incorporating service-learning and critical-making approaches can foster social responsibility and support students in creative waste recycling initiatives in a school and community setting. Most importantly, the course offers a critical approach to new media art education, which is crucial to exposing, criticizing, and raising awareness of the human and environmental implications of materials production and consumption. This approach can inspire collective actions that lead to a more sustainable future. The course collaborates with the university's Community-Engaged Learning Office (CELO), which connects faculty and students with the surrounding community and facilitates academic service-learning opportunities. Student reflections and project outcomes across four course iterations show that incorporating service-learning and community engagement into sustainability education not only enriches academic learning but also empowers students to take meaningful action, effectively

bridging the gap between theoretical knowledge and real-world application.

Introduction

In 2016, the documentary *Plastic China* was released. This was the second film by Chinese artist and filmmaker Wang Jiuliang that focused on the issue of waste. The documentary highlighted how the global economic system enabled wealthy nations to shift the burden of their waste pollution to China. It addressed concerns such as labor exploitation, poor living conditions, and limited access to healthcare and education for workers in the waste recycling industry, in addition to environmental pollution. Through his films, Wang sparked public discussions about the waste crisis, a trend that has also been evident among other Chinese artists who raise awareness of social injustices and encourage greater consciousness regarding environmental issues (Wang, 2019a). Despite the documentary being prohibited from public screenings in China, the Chinese government announced in 2017 a ban on the import of most domestic recyclables from many countries. This decision aimed to enforce environmental laws geared towards improving the environment and enhancing the quality of life in China.

These events inspired the creation of the course *Re-Made in China*. The course was designed to be provided by the Interactive Media Arts program, an undergraduate major within New York University Shanghai, the first Sino-US degree-granting research university. Around half of the students come from China and the other half from the United States and over seventy other countries. The *Re-Made in China* course has no prerequisites and students from any major can enroll due to the institution's focus on liberal arts education.

The *Re-Made in China* course begins by guiding students to explore sustainability, starting with the definition of sustainable development published in 1987 by the United Nations, also known as the Brundtland Report. This report defines sustainability as:

> **"Meeting the needs and aspirations of the present without compromising the ability to meet those of the future" (Brundtland, 1987).**

Endorsed by commissioners from over twenty diverse countries, the report positions sustainable development as a vital aspect of international development, particularly in light of the inequalities that exacerbate poverty, deplete natural resources, and contribute to global warming, especially in developing countries.

With an understanding of sustainability encompassing three interconnected elements—environment, equity, and economy—students investigate innovative ways to transform discarded materials while working with local communities. As part of their main course assignment, they propose relevant solutions for their needs via service-learning projects. As a result, alongside developing technical skills and fostering creativity, students gain a critical and broad understanding of sustainability, a stronger attachment to possibilities of civic engagement, and a deeper understanding of aspects of social responsibility.

In response to the urgent challenge of plastic waste faced by modern societies, many policies and organizations advocate for recycling and repurposing initiatives. However, as educators, teaching on this topic should go beyond technical instruction about how to remake or repurpose. It should also integrate critical-making and community-engaged learning that empowers students to develop social responsibility and citizenship skills. The importance of community engagement cannot be overstated, as it plays a crucial role in developing these skills. Indeed, including service-learning is essential for fostering accountability and driving students to complete projects that they consider meaningful.

This paper explores the impact of the course *Re-Made in China* on increasing awareness about environmental issues and encouraging community

involvement. We will also discuss the valuable insights gained from teaching this course four times, modifying the curriculum and introducing service-learning in the latter two times it was taught. Additionally, we will elaborate on why focusing solely on recycling waste or transforming it into new products was not the main emphasis of the course, and why it was crucial to integrate community-focused education and service-learning with a critical-making approach.

Service-Learning and Critical-Making

As a global trend in higher education, an increasing number of courses at the university level aim to extend beyond the classroom walls to bring students into constructive and academically meaningful engagement with people and issues in local communities (Furco & Kent, 2019). Such courses aim to enhance the quality and stakes of student learning by asking students to apply and interpret course skills and concepts under real world conditions, promoting self-reflection and personal growth, and building mutually beneficial relationships between universities and their surrounding environment. Academic service-learning is identified as a high-impact pedagogical method (Kuh, 2008) with formal courses institutionalized in institutions of higher education since the mid-20th century (Stanton & Giles, 2017).

Academic service-learning combines academic study with applied experiences in which students work to constructively address community-based needs while intentionally and critically reflecting on the process and effects of their service experiences to enhance their academic and overall learning. Beyond the knowledge-based goals of a course, students' reflections on their real-world experiences can lead to personal growth, increased civic engagement, and preparation for future professional scenarios (Ash & Clayton, 2009).

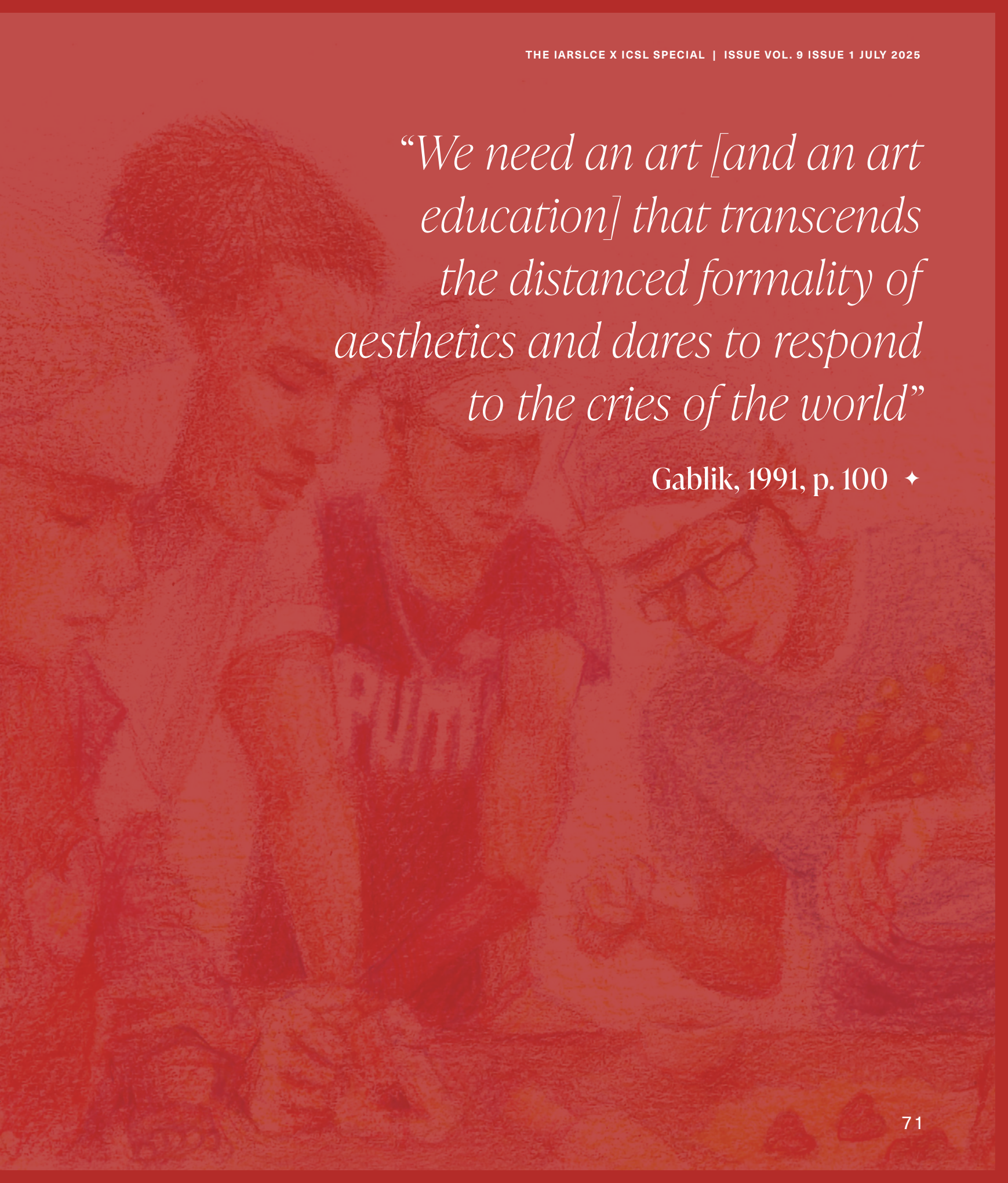
On the other hand, art that is critical and socially engaged has played a significant role in exposing how the globalized economic system has contributed to social inequality, labor exploitation, and the production of over a billion tons of waste each year. As observed by the art scholar Meiqin Wang, there is a rise of artists in China who use their work for social criticism, community building, and personal development within their professional practices. Wang adds that even with the difficulties and dangers tied to this kind of work in China, they dedicate themselves to direct social involvement and civic engagement, believing in the potential of individual efforts for bottom-up social change and recognizing the imperative to do so within the entire intellectual community (Wang, 2019b).

Incorporating this approach into art education is essential for maintaining focus on pressing social and environmental issues, raising awareness, and inspiring collective action towards a more sustainable future. These ideas have been acknowledged by artists and educators. In 1991, the artist, critic and scholar Suzi Gablik emphasized that:

> ***"We need an art [and an art education] that transcends the distanced formality of aesthetics and dares to respond to the cries of the world" (Gablik, 1991, p. 100).***

She viewed the primary role of artists as similar to that of social workers, highlighting the importance of those who clean up the environment, provide homes for homeless people, and show kindness to marginalized groups such as garbage collectors, kids, street people or drunks (Johnston, 1993, p. 39).

In the field of sustainability in education, scholar Kyungeun Sung conducted an extensive literature review exploring upcycling for and in higher education. Sung emphasizes its relevance to contributing to sustainable development and educational practices on sustainability. She points out that there has been limited focus on how universities incorporate upcycling into their teaching and learning strategies (Sung et al., 2020, p. 372). In the *Re-Made in China* course, students



"We need an art [and an art education] that transcends the distanced formality of aesthetics and dares to respond to the cries of the world"

Gablik, 1991, p. 100 ✦

learn about sustainability through the process of upcycling. They explore how to create new materials from discarded items, using a combination of traditional and modern fabrication technologies. The course also encourages students to consider critical questions such as: *Why are we making these items? How can what we make be useful rather than wasteful?* Students are prompted to think critically about the relationship between technology and society. Furthermore, they learn how to use art and new media art as powerful tools for exploring innovative design possibilities while also fostering social awareness and reflection. Through this methodology, students can propose unique solutions to environmental and other social issues.

> **Scholars Amanda Alexander and Ross H. Schlemmer, state that integrating service-learning into an art education curriculum can result in various positive outcomes, including civic engagement, social justice, and the development of artistic skills (Alexander & Schlemmer, 2021, p. 6).**

Drawing from their experiences as educators, they emphasize the importance of critical pedagogy in addressing the negative effects of neoliberal globalization, advocating for a curriculum that encourages questioning and critical thinking. However, they also acknowledge challenges in prompting deep critical reflections and suggest that structured guidance is essential for meaningful engagement.

Re-Made in China and Service-Learning

According to Matt Ratto, critical-making is a form of goal-oriented material work, distinct from the intellectually and linguistically grounded approach of critical-thinking. When implementing a critical-making approach, prototypes are viewed as a means to a goal and are valuable since they were created collaboratively as the result of discussion and reflection (Ratto, 2011). In 2018, *Re-Made in China* was introduced as a seven-week course to educate students on waste during a time when China was the world's largest waste importer (Qu et al., 2019). It later expanded to a fourteen-week course, allowing for more in-depth discussions, research, and experimentation. In both versions, the breadth of student projects was very diverse, ranging from a plastic bag-to-thread spinning machine to fashion, industrial design, and art projects, utilizing techniques such as weaving, molding, and pressing.

However, a crucial element was missing- real-world experience. Without this, projects lacked a genuine understanding of people's needs. Therefore, the course was redesigned in collaboration with the Community-Engaged Learning Office (CELO) as a service-learning course. The incorporation of service-learning proved to be instrumental in facilitating critical-making. The course embraced an open-ended approach, allowing students to partner with members of their community and work collaboratively to identify potential needs and problems.

In the initial two iterations of the course, students were encouraged to investigate local communities beyond the school in order to gain insights into their waste management practices and to discover innovative methods for transforming discarded materials or products into something valuable. During the early weeks, they developed local maps to monitor trash routes within their dormitories and on campus, conducted interviews with cleaning staff, and even participated in a beach cleanup to deepen their understanding of the waste cycle in their local surroundings. After trying out various techniques to recycle plastic, they proposed sustainable design concepts that could be shared online and potentially replicated by others. One of the projects in the first semester was a raincoat that repurposed IKEA bags. However, it was

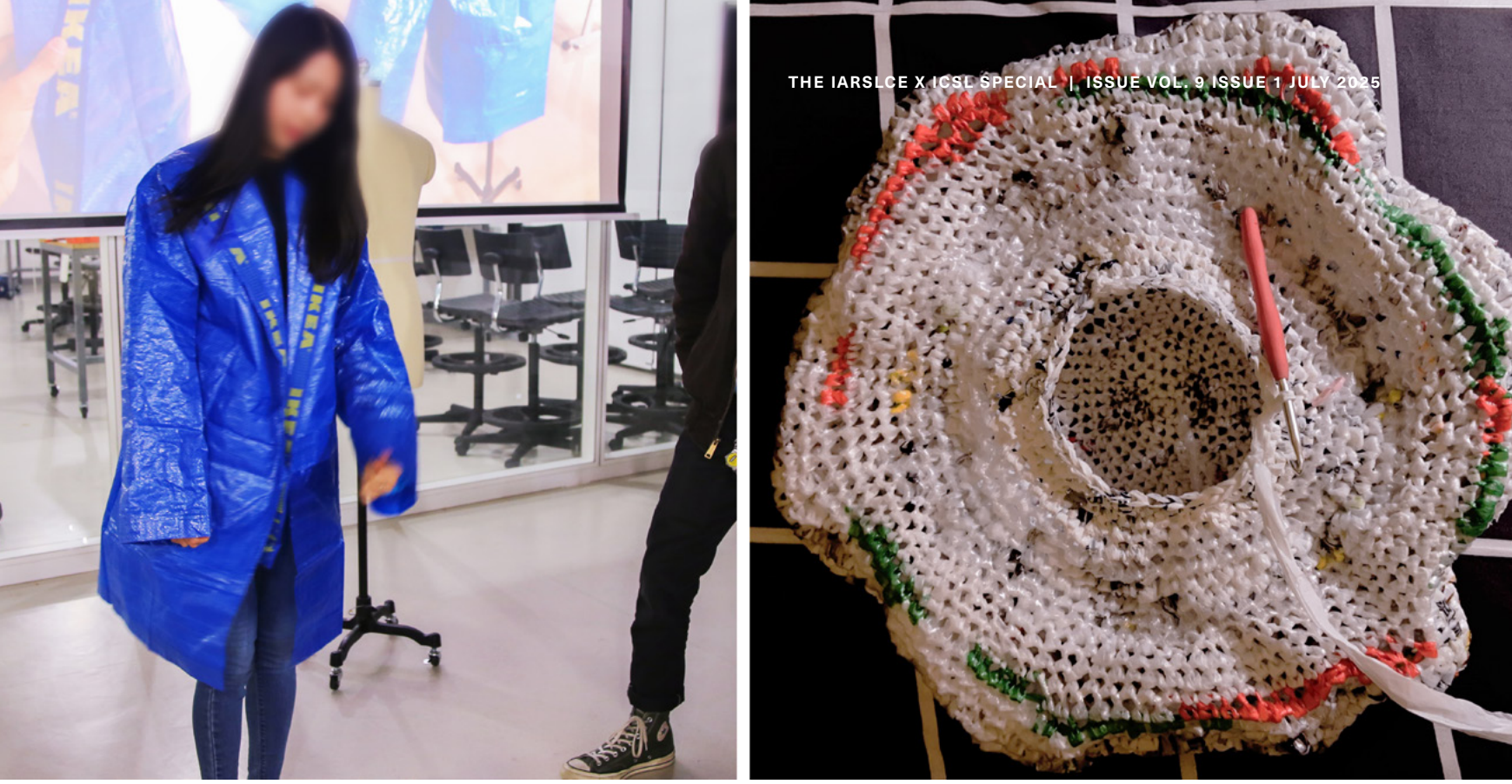


Fig. 1. *Two examples of final projects from the first two iterations of the course that did not include service-learning. On the left: Final project Re-Made in China Fall 2018, a raincoat made from repurposed IKEA bags. On the right: Final project Re-Made in China Fall 2019, a seat cushion created using a technique that transforms plastic bags into yarn, which is then crocheted.*

disappointing to learn that the student bought new bags instead of recycling used bags to make this project. As the student explained in his reflection, he wanted to challenge himself to actually make clothes and experience that process. He added that the class really opened his eyes to the limitless possibilities of what one can make by reusing and readapting plastics (Abdi, 2018).

Another project, from the second semester the course was taught, was a crocheted seat cushion made with yarn produced from plastic bags. Upon completion of the project, the student planned on making a .pdf or zine tutorial to teach others how to make the yarn and crochet it. However, due to existing tutorials on the internet, the student felt that making a guide would be redundant. She concluded that if she had more time she would like to work on a tutorial or workshop translated into Chinese as a way to introduce the skills and findings from her project into the Shanghai community (Wang, 2019c).

In every course iteration, guest speakers were included in order to establish connections with local communities and provide diverse perspectives on sustainability. The guest speakers included designers, entrepreneurs, and representatives from organizations working in the field of sustainability, as well as a local trash collector who offered insights from his direct involvement in waste management, revealing firsthand information about what is discarded and recycled in Shanghai. Throughout the semester, students engaged with these guest speakers to explore waste and recycling, discussing the impacts of capitalism, economic progress, and technological advancements on equity and justice. The connection with members of the Shanghai

community aimed to ensure that, alongside technical skills and creative development, students acquired a critical and broad understanding of sustainability, a stronger attachment to possibilities of civic engagement, and a deeper awareness of social responsibility. After listening to the trash collector's talk, one student remarked:

"His story not only helped me think about how plastic waste was sourced, but also how recycling should not be seen only as an environmental movement, but also about human rights and economic justice" (Zhao, 2019, p.23).

Fig. 2. *Trash collector Yan Xinyu giving a talk in Fall 2018, after Shanghai implemented trash sorting policies. He shared his experiences as a trash collector, described his job, and explained to students how these new policies changed his work after more than twenty years in the field.*

In the following two iterations of the course, we continued to invite guest speakers from local communities and organizations. Additionally, we incorporated service-learning and began collaborating with community partners. The Community-Engaged Learning Office (CELO) established the connections with these partners and introduced them to the instructor prior to the start of the semester. To determine what the students might be able to accomplish, information was gathered by the CELO and instructor beforehand, such as what partners do in their communities and how their community functions. In the service-learning versions of the course, the CELO helped students to establish relationships with oft-overlooked members of the campus and community members in a neighborhood nearby the school, interviewing them about their work and ongoing challenges, and then brainstorming ways to use recycled materials to address one of their needs.

Fig. 3. *After learning from faculty, students conducted workshops to teach community partners how to recycle plastic bags using fusing techniques to create coin purses. On the left: Students conducting a workshop for family groups. On the right: Students conducting a workshop for retirees.*

The course created opportunities where students and community partners could meet and get to know each other better. For example, workshops were held with the local residents in which the students would teach them how to make something useful out of waste or in which the local residents would teach students one of their crafting skills. Local residents were also invited to come onto campus for the opening of the class art exhibit. At these events, the students and community partners could interact and learn from each other in a more relaxed, casual setting.

In the end, some of the students' service-learning projects included a trolley for cleaning staff to carry heavy tools, garbage tongs for volunteers in the neighborhood to pick up litter, a rainwater collection system for a community garden, and a space divider to create privacy for cafeteria staff on their breaks. This divider is a good example of how students combined recycling with critical making in their projects. During their research process, the team debated whether they wanted to make something to help the cafeteria with their waste problem or to help the workers directly. Eventually, they concluded that sustainability is not just about addressing waste but also about people's well-being, so they decided to look into topics related to staff well-being and working conditions. One problem they found was the lack of rest areas for cafeteria staff. They also noticed that while male workers would lie in the sitting areas and nap or play on their phones, female workers never did that in public spaces. This gender-based difference made the students more determined to tackle this problem. Their final project, made from waste collected from a construction site, not only offered privacy but also featured educational materials on sustainability and recycling. The students' final reflections highlighted that this experience helped them to realize that the project was not only about helping their community partners; it was also about noticing and empathizing with people around them and providing them with more opportunities.

Outcomes and Discussion

After analyzing student reflections and project outcomes across four iterations of the course, we found that in the versions that did not include service-learning, students were more focused on challenging themselves by upcycling materials and learning new skills through the creation of different objects. While the inclusion of guest speakers and activities outside the classroom provided motivation for sharing their work beyond the school environment, it fell short of helping them fully comprehend the potential impact of their creations. Moreover, this approach was insufficient for students to develop a critical and comprehensive understanding of sustainability,

strengthen their connection to civic engagement, or gain deeper awareness of social responsibility.

The approach taken to service in this course was open-ended in that students identified potential needs of their community partners through a process of observations and interviews and then decided together with their community partners on a specific project objective. Studies show that students demonstrate a higher level of motivation when they have more choice and autonomy (Evans & Boucher, 2015) and that they are more likely to be genuinely interested in topics that they identify themselves and find meaningful (Deci et al., 2004).

Still, open-ended projects can require substantial time to evolve as prototypes are tested and improved upon. Due to inexperience, students may underestimate or overlook limitations in what can be realistically accomplished in the limited time frame of a course. The specific project goals also must be negotiated with clients, and this can sometimes lead to misaligned expectations and difficulties if students are not well-supported to assess and navigate the available choices (Katz & Astor, 2006). In response to such challenges, tactics like providing guiding parameters and rubrics for group work and decision-making, role-playing common scenarios students will likely encounter in their work, and providing formal check-ins with the instructor and CELO staff at every stage of the work can help to prevent or mitigate problems and facilitate smoother implementation of projects.

Indeed, to address challenges while teaching this course as an academic service-learning course, collaborating with the university's Community-Engaged Learning Office (CELO) was essential. CELO support enabled faculty to facilitate interactions between students and local communities, as well as to design assignments and sessions that encouraged discussion and reflection among students. These sessions were intended to emphasize the significant impact of an approach focused on helping students develop both mentally and emotionally, preparing them for real-life experiences.

Fig. 4. *End-of-Semester Show, Fall of 2020. The exhibition showcases final projects that include the space divider for cafeteria workers. The divider holds tutorials and crafts for staff to learn about recycling. Additionally, a chair and a massage device intended for cafeteria staff to use during their breaks. The collection also features photo frames displaying photographs aimed at raising community awareness about the significance of proper waste sorting.*

Throughout the semester, students were encouraged to critically analyze their experiences and connect them to broader concepts and themes discussed in class. To support this, the course incorporated intentional reflections through written assignments, in-class discussions, and presentations. With these types of structured reflections, students not only deepened their understanding of the material but also developed a sense of self-awareness and identified areas for further growth and development.

The projects that students created in the service-learning versions of the course showcased thoughtful reflections and discussions about the projects they wanted to make. Additionally, students exhibited both an awareness of and a commitment to help their community partners, going beyond merely learning new skills and upcycling materials. As a result, their decisions and reflections demonstrated a sense of responsibility, elevating the experience of completing a school project into something far more meaningful for them.

Conclusion

After introducing service-learning into the course, we noticed a shift in the breadth and depth of students' learning. Although they still recognized the environmental damage caused by consumerism, they also demonstrated a newfound concern for their community partners and other people they did not usually notice. Their reflections demonstrated personal growth achieved through experiences with real people. In-class discussions and redesigned assignments facilitated

critical analysis and fostered a feeling of responsibility, increasing students' motivation to complete their projects as their work became much more meaningful. One of the students who worked with one of the cleaning staff (Huang Ayi) on campus reflected in an interview:

> **"This class opened my mind to designing for others...An important thing is that I know how to talk with people like Huang Ayi, people such as those essential workers: taxi drivers, bus drivers. Before this experience, I respected them, but I wouldn't talk with them much. I would think, 'Why should I talk with those guys?' But now I regularly chat with the driver if I take a taxi. Sometimes I chat with the workers in my neighborhood. It just made me a more friendly person."**

> **"Working with different groups of people is really challenging but educational. Previously, I was just working with my friends or my other college students—people who are similar to me. But this time I was working with someone who was completely different from me—her job, her life, her social status, everything was completely different—and we still had a nice cooperation. It was really educational (Geng, 2023)."**

The experiences and skills students exercised through service-learning exceeded what they could have gained through conventional classroom instruction alone and their understanding of the course subject matter went much deeper than before service-learning was incorporated. Thus, the inclusion of service-learning and critical making aims to become an ongoing part of teaching on sustainability and its real-world applications in this course.

Marcela Godoy

Marcela Godoy is a practice-based researcher who uses critical making and fabrication technologies to explore new architectural possibilities, promote social reflection, and propose unique solutions to environmental challenges. With a background in architecture and interaction design, her work incorporates a wide range of research and form. She applies computational design and critical making to explore the amalgamation of digital and crafting techniques, resulting in interactive and kinetic structures, wearables, data physicalization, toys, and upcycled artifacts. Godoy's current research focuses on working with discarded materials to design artifacts using digital and analog machinery with low environmental impact.

Diane Geng

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Diane Geng is Assistant Provost for Academic Affairs at NYU Shanghai and directs the Office for Community-Engaged Learning. Her work focuses on designing and implementing community-based educational initiatives that cultivate meaningful and mutually supportive relationships between people. She is particularly interested in supporting grassroots social innovation and fostering inclusive, high-quality education systems.

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