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ADAPTING EDUCATION + INDUSTRY COLLABORATION FOR COVID AND BEYOND

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PAPER ABSTRACT: During the COVID-era, design educators, design students, and design practitioners alike have been forced to adapt their creative practices to online learning and working modalities. We, an industrial design program that has come to rely on frequent engagement with local industry within our project-based curriculum, realized that we not only had to rethink the ways in which we engage our students, but also the ways in which we engage professional practitioners due to the needed response for public health concerns. This situation led us to organize and implement a novel, online adaptation of a "design charrette." Our main goal was to reignite industry partnerships in our program during the COVID era, with an eye toward improving future industry collaboration. The project involved IC3D, a local company that specializes in large scale 3D-printing, as well as several individual design practitioners from our local design community. This paper details a case study of a design charrette spread across half a dozen online collaboration tools, out of which student teams proposed fifteen "parklet" design concepts. The experience resulted in a successful education-industry collaboration, blazing new trails for fruitful hybrid collaboration in the post-COVID era.

Keywords: Industry Collaboration, Case Study, Design Charrette, Design Education, Distance-learning.

1. INTRODUCTION

After a year behind their screens, students and their instructors felt the weight of the COVID Pandemic. Remote learning has rendered difficult the achievement of the type of learning outcomes design programs aim to cover when the shops and studios are out of reach (Wong, 2007). However, challenges like this are nothing other than design problems, meaning that behind limitations typically hide unexplored opportunities (Jones et al., 2017; Jones et al., 2019). While some design educators have leveraged COVID-era challenges as a focal point for work and concerns revolving around collaboration between academia and industry with an eye toward a post-COVID future (e.g., Elçioğlu, 2020), our study took a different approach; while maintaining a post-COVID orientation, we used COVID-era challenges as a lens to rethink the architecture of academia/industry collaboration.

The case study presented in this paper features a "design charrette" pedagogical activity we conducted at The Ohio State University. Through this effort we sought to adapt an established, pre-COVID approach for facilitating an unconventional expression of the design process (i.e., a design charrette) to recently popularized communication modalities now common in education and professional practice in the COVID era (e.g., video conferencing and browser-based whiteboard tools). The purpose of our effort

was to reignite industry partnerships in our program during the COVID era, with an eye toward improving future industry collaboration.

This paper will provide background on the circumstances which gave rise to our design charrette, its structure, results, learning outcomes, and discuss how elements of our distance-adapted efforts might augment similar educational engagements with industry in the post-COVID era.

2. BACKGROUND

In the first weeks of Fall semester, 2020, design faculty, instructors, and students alike were forced to adapt to a new teaching environment, one that had been transformed by the onset of a global pandemic. “Distance,” “distance enhanced,” and “hybrid” course delivery models (The Ohio State University, 2021) hashed-out amid a “second wave” of COVID-19 infections over the Summer challenged our instructors to recreate interactive, interpersonal learning environments with a slew of digital facsimiles for face-to-face interaction common in our design studios. As our design students jumped into their studio projects, they relied on pre-COVID mainstay digital tools like email, Slack, Canvas, and GroupMe, as well as newly introduced digital tools including Zoom, Wonder, and Miro. While our weekly in-class interactions may have been spirited, we would be lying if we said everything was a “well-coordinated, well-executed effort.”

Our design program has long made use of connections within the local design community to inform our students’ learnings with the realities of professional practice; practitioners have been frequent guest speakers, reviewers, and mentors. We had no intention of allowing a global pandemic to rob our students of the opportunities to interact with acting professionals!

Interactions with our practitioner counterparts during the first half of Fall semester, 2020, revealed to us that they were grappling with many of the same COVID induced changes to their creative practice as we had been experiencing. Our faculty, students and industry colleagues felt a sense of community, perhaps stemming from commiseration, in our shared digital lives. Although our COVID-era encounters may have been constrained in new ways, e.g., multi-speaker conversations with shared visuals felt cumbersome in Zoom, there were also hints of new possibilities for collaboration and engagement, e.g., a COVID-era invitation to mentor a student team for 45-minutes via Zoom did not come with the pre-COVID burden of leaving work, driving to campus, finding and paying for parking - a half-day headache!

Considering newfound COVID-era flexibility, thanks to communication tools popularized during the COVID-era, and in line with an almost tangible longing for interpersonal contact, we decided the ground was fertile for a structured collaboration with industry. Two of our faculty were familiar with a high-intensity collaborative project structure called a charrette – or “an intense, collaborative session in which a group of designers drafts a solution to a design problem in a time critical environment” (Eagen, Ngwenyama, & Prescod, 2008) – that, in pre-COVID times, had been successfully implemented to foster

the type of industry collaboration we desired (Smith, 2012). Yet questions remained: how might the charrette project approach be adapted to COVID-era needs and limitations? In what ways could practitioners be engaged most efficiently? What modes of COVID-era communication would best facilitate interactions? How would we define success? And what might we take with us into the post-COVID world?

To copilot what we viewed as an ambitious and experimental project, we partnered with IC3D, a local manufacturer specializing in large-scale 3D-printing which had already established a reputation for COVID-era innovation (Donndelinger, 2021), despite employing no industrial designers. We then recruited two Columbus, OH area design practitioners with whom we had previously developed relationships for the purpose of adding strategic design expertise to an advisory team. What resulted was a COVID-era design charrette that engaged 47 students, 4 practitioners, and 4 design faculty while blazing a new trail for industry collaboration.

3. A COVID-ERA DESIGN CHARRETTE (METHOD)

We conceived a COVID era design charrette as a seventeen-day project to take place halfway through our Spring semester, 2021. We sought to develop our charrette to 1) strategically facilitate active engagement between our students and professional design practitioners, 2) leverage a pan-industry increase in competence with and appetite for synchronous, online video conferencing (e.g., Zoom), while 3) piloting a new combination of digital tools popularized during the COVID-era, with an eye for overcoming their perceived limitations.

3.1 A COVID-ERA PROJECT THEME

Our faculty team sought a charrette theme that would simultaneously anchor student work in the present historical moment and leverage our industry partners' capabilities and interests. In anticipation of an eventual return to campus Fall semester, 2021, and in conjunction with an on-campus initiative to develop an ecosystem for the Arts, we challenged student teams to transform an underused, on-campus courtyard adjacent to our design building through the design of a "parklet" – a temporary recreational place to foster community.

3.2 STUDENT PARTICIPATION

All forty-seven students enrolled in the industrial design major participated, including sophomore, junior, and senior-level undergraduate cohorts. Instructors devised teams beforehand to ensure equitable distribution of strengths and experience. Typical teams were composed of three students, one from each cohort. To accommodate the imbalanced cohorts of our program, certain teams derogated from this typical model; for instance, one team was composed of two seniors and two sophomores.

3.3 ROLES AND RESPONSIBILITIES (STUDENTS, FACULTY, PROS)

A leadership activity (Stewart, 2008) helped students to define roles and responsibilities within their teams, as well as separate their design abilities from their roles as teammates.

Faculty chose to strictly constrain their advisory role to questions concerning project management, e.g., how to contact advisory team members, where to find resources, where to submit deliverables. The rationale behind this uncommon approach to teaching, or in this case not-teaching, aligned with the learning goals of raising students' autonomy and developing their confidence. At this point in the curriculum, we expected our senior level students to be able to make design decisions on their own. At the same time, we wanted our sophomore students to see how students only two years ahead of them can navigate a design project without the oversight and intervention of their studio instructor.

However, we were not dismissive of common student uncertainties and their need for information and advice. Given that one goal of the charrette was to cultivate collaboration and extension with professional practice, we saw a way to engage our partners more deeply by limiting the advisory role of faculty. Partners' roles and responsibilities were twofold. First, two staff members from IC3D acted as "technical advisors," providing teams with information and insight regarding how their concepts might integrate the IC3D's core competency of large-scale 3D-printing. Second, two professionals from the broader Columbus design community – an industrial designer and an architectural designer with an industrial design background – provided teams with "critique" on their concepts, as well as advice on applying the design process.

3.4 DIGITAL TOOLS AND PLATFORMS

To facilitate an entirely "distanced" charrette, we made use of several digital tools and platforms outlined in the Appendix.

3.5 CHARRETTE TIMELINE

The charrette took place between March 5 and March 24, 2021, with synchronous sessions split between typical working hours and evenings. This schedule, outlined in the Appendix, allowed us to dedicate five class sessions to the project, maximize weekends to render student agenda coordination easier, and provide ample scheduling accommodation for professional participants to attend advising activities.

3.6 ADDITIONAL CHARETTE MECHANICS

To build anticipation for the charrette, all details about the project were not revealed until a virtual kick-off event, which presented key background information and introduced students to industry partners and professional design advisors. Student teams were provided with a design brief (see Annex), which contained additional background and reference materials, links to the various communication tools we would be using, and success criteria for their concepts. A leadership-focused team building activity

followed, reinforcing team autonomy (i.e., independence from faculty direction). To further encourage team autonomy and provide fertile ground for teams to engage with advisors, we specified open-ended objectives (required) and "stretch goals" (elective) in the design brief, which is outlined in the Appendix.

In our experience, a design charrette – like other design work structures – thrives on flexible, synchronous communication, both verbal and visual; we wanted students to be able to freely form small groups to converse and share ideas, move from group to group, send group members to speak with advisors, and "spy" on one another's interactions. Additionally, we wanted to provide advisors with the flexibility of joining and leaving advising sessions as their schedule would allow within set time slots and allow advisors to move freely between emergent student group gatherings to "check-in" on their progress. To achieve this, we adopted a browser-based video chat platform called Wonder (https://www.wonder.me), which, after initial testing, would allow us to facilitate the types of pre-COVID engagement we desired.

To underscore a shared understanding of the charrette theme and project objectives, all charrette participants were provided assessment criteria, which took the dual forms of a grading rubric (common and well understood in the academic context) and "accolades" – special recognitions of effort awarded by faculty and external partners (imitating the design competition context more familiar to them).

3.7 DELIVERABLES

Our distance-adapted charrette called for all deliverables to be captured and submitted in a digital format. Student teams were required to visualize their parklet concepts in a large-format digital poster as well as a four-minute recorded presentation, then submit their work via a shared Miro board. Additionally, students were required to complete an anonymous peer assessment of their teammates through summative ratings and formative, open-ended comments. Students also anonymously assessed their experiences in the charrette via a formative, open-ended form. Our industry colleagues assessed student work independently, provided text-based formative feedback, then awarded top team projects "juror's choice" accolades.

4. RESULTS

Student teams succeeded in producing fifteen parklet concepts, shown in the Appendix, while consulting with all four industry colleagues during eight advising sessions. Industry collaborators and faculty reviewed all fifteen parklet concepts and awarded 36 project accolades, and all final projects were published in an online gallery (Gümüş Çiftçi, Nickley, & Proulx, 2021).

4.1 PARKLET CONCEPTS AND PRODUCTION

In their posters and presentations, students presented unique parklet concepts that made use of the designated on-campus courtyard and IC3D's capabilities. Of the fifteen concepts presented, IC3D selected components from seven of them to later manufacture at full-scale.

Figure 1. Student parklet concept "Afterhours" proposes the use of modular, 3D-printed components and lumber to form seating and a shade structure in an existing on-campus amphitheater.

Figure 2. Student parklet concept "Bloom" combines 3D-printed and rope elements to form communal hammock-like seating in the grassy areas of an on-campus courtyard.

Figure 3. Student parklet concept "Dune" uses large, modular, 3D-printed structures to create seating and tables on a low, concrete step; the components emulate a playful waveform.

4.2 COVID-ERA FACILITATION RESULTS

During scheduled advising sessions, students, faculty, and industry colleagues engaged in Wonder – our browser-based video conference space – by remotely accessing the tool, then organically joining small group discussions. Guiding the discussion topics were six thematic areas, including one area for each of three advising topics (Project Advising, Technical Advising, Design Advising), a "Team Chat" area, a "Coffee House," and "Back in a Minute" area (Figure 4). When joining an emergent Wonder group, a participant entered a video conference environment where they could speak and see others in the group and share their screen (Figure 5).

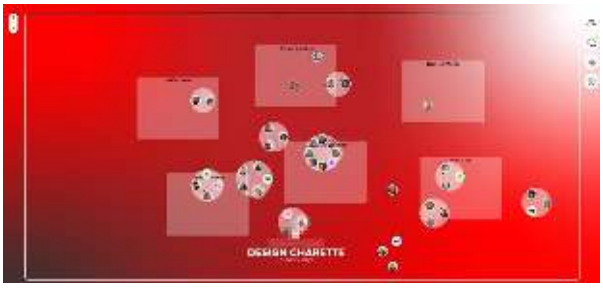

Figure 4. Screenshot of the browser-based Wonder interface for our design charrette advising hours, shown here with 43 students and advisors engaging in emergent video chat groups among six thematic areas.

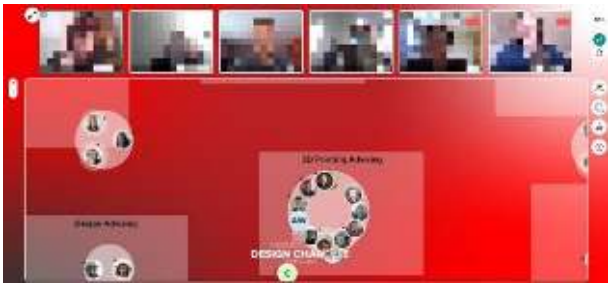

Figure 5. Screenshot from an advising session on Wonder; shown here are six video feeds from the 12 participants in an emergent group within the 3D Printing Advising area.

Technical advising ("3D printing advising" in Figure 5), led by two staff members at IC3D, was frequently the most well-attended group. Although we did not track every participant's movement over time, nor the topics of each group's engagement, through frequent check-ins the authors had the impression that Wonder advising sessions worked as planned because "participation means...come together in one

location, exchange views and expertise, and from there forge new understandings in a generative and creative space" (Smith, 2012).

4.3 LEARNING OUTCOMES

In peer assessments of their teammates (n=47), as a group, the students expressed a nuanced understanding of team dynamics, including their capacity to identify positive and negative contributions through design work, leadership, and attitude.

In student self-assessments of their charrette experiences (n=27), students most frequently cited time management (n=3) and a large workload (n=2) as their biggest challenges. The most frequently cited positive experiences centered teammates and team collaboration (n=12). Some students expressed negative experiences related to teammates (n=2), or technical issues (n=3).

During informal communications with our industry colleagues regarding their experiences, comments were overwhelmingly positive. One practitioner expressed their excitement to involve her colleagues in future opportunities like our charrette. Both practicing designers expressed their willingness to participate in the future and commented on the ease of participating remotely. Additionally, because of the increased understanding of our students' capabilities, IC3D expressed an interest in hiring two industrial design interns – a first for IC3D!

5. DISCUSSION

Our charrette adapted to the socially distant circumstances resulting from the COVID-19 global pandemic out of necessity. However, results indicate that elements from our COVID era approach might prove beneficial in facilitating post-COVID industry engagements.

5.1 COVID ERA NECESSITY = POST COVID CONVENIENCE

All our industry colleagues were able to engage in each of our advising sessions. They were also able to assess and provide feedback to all student teams on their final concepts. Consistent industry participation like this is not always the case! This finding was surprising to us given our past experiences working with industry colleagues, whose demanding work schedules often limit their ability to engage our students. While we can credit our colleagues, we also attribute the success of continued engagement to our charrette's structure and its integration of COVID era communication tools. More specifically, the flexibility provided by one tool – Wonder – and its drop-in/drop-out video conference format, coupled with the fact that industry partners could access the tool remotely, proved effective in allowing student teams to engage with our industry colleagues to discuss their concepts. Moreover, we hope to leverage tools like Wonder in the post-COVID era to allow industry folks to avoid the inconveniences of visiting campus for short, informal advisory sessions and presentations.

5.2 A PLATFORM FOR EVERY SITUATION ≠ FLUIDITY OF USE

Section 3.4 highlighted six digital tools implemented during our COVID era charrette. Although our intent was to provide a digital facsimile for each charrette activity – activities that would be in-person pre-COVID – we did not anticipate the difficulty our students would encounter while navigating all the tools on their own. This issue was exacerbated by faculty's limited synchronous interactions with student teams to provide clarification. During the charrette, we provided a partial remedy in the form of URLs to cross-link tools, and we ensured the project brief had clear links to each tool and resource.

5.3 LIMITED ADVISORY ROLES = LIMITED CONCEPTS

Although student concepts exceeded IC3D's expectations, as evidenced by their selection of seven concepts for further production, our faculty team felt concepts lacked some of the depth and ambition we had hoped to see. Contributing factors may have included an emphasis on manufacturing constraints from IC3D, charrette time constraints, a lack of in-person communication, and framing of the charrette challenge in the design brief. However, as faculty, we often felt a painful urge to provide conceptual guidance to teams during project advising sessions! Perhaps this view is self-serving (or narcissistic), or even insulting to our industry colleagues (who did provide design feedback), but we feel that another contributing factor to our students' limited concepts is our self-imposed gag-order on providing design feedback.

5.4 ADAPTABLE ENGAGEMENT = INCREASED OUTCOME TANGIBILITY

While it is difficult to ascribe the success of our students in enticing our industry partner to select seven concepts for production – six more than their initial commitment – to any one thing, we feel their frequent communication with student teams was a key contributing factor. Industry engagement, made adaptable through remote access and flexible drop-in/drop-out advisory sessions, allowed our industry colleagues to become familiar with and contribute to student concepts, which may have afforded IC3D's employees a better understanding of student concept merits; their understanding was not limited to a single concept presentation. We imagine future industry engagements might benefit from adaptable engagement and see a similar increase in tangible results.

6. CONCLUSION

The COVID-19 pandemic has asked us all to demonstrate our capacity for resiliency. The pedagogical case study presented in this paper – a distanced design charrette – offers new knowledge surrounding the use of digital tools and methods popularized during the COVID-era as pathways toward resilient and highly engaging collaboration between design education and design industry. Beyond the cliché of the "new normal," there is indeed a post-COVID world in which our learnings, as faculty leveraging challenging circumstances to fuel the development of a new pedagogical approach, will inform other educators about how to catalyze industry partnerships more effectively, both online and in-person.

REFERENCES

Donndelinger, C. (2021). *Distributed additive manufacturing for emergency PPE production by IC3D*. IC3D Industries. https://www.ic3dprinters.com/distributed-additive-manufacturing-for-emergency-ppe-production-by-ic3d/

Eagen, W., Ngwenyama, O., & Prescod, F. (2008). The design charrette in the classroom as a method for outcomes-based action learning in IS design. *Information Systems Education Journal, 6*(19). https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.470.4698&rep=rep1&type=pdf

Elçioğlu, M. (2020). How swift is academia to adapt to industry? A case-study in search of a more adaptive method for academia-industry collaboration in peri-pandemic & post-pandemic norms. *IDSA Education Papers.* https://www.idsa.org/educationpaper/how-swift-academia-adapt-industry

Gümüş Çiftçi, H., Nickley, W., & Proulx, S. (2021, April 5). *Design charrette: Spring 2021*. Miro. https://go.osu.edu/design_charette_2021_gallery

Jones, D., Lotz, N., & Holden, G. (2017). Lurking and learning: Making learning visible in a virtual design studio. Proceedings of the *LearnX Design 2017 Conference*, Pritchard, Gary and Lambert, Nick eds., London, pp. 176–183

Lotz, N., Jones, D., & Holden, G. (2019). OpenDesignStudio: virtual studio development over a decade. Proceedings of the *LearnX Design 2019 Conference*, Ankara, Turkey

Smith, N. D. (2012). Design charrette: A vehicle for consultation or collaboration?. In Proceedings, *Participatory Innovation Conference 2012*. Swinburne University, Melbourne, Australia. https://www.academia.edu/download/7826079/Design%20Charrette%20%20A%20Vehicle%20for%20Consultation%20or%20Collaboration.pdf

Stewart, M. (2008, December 18). *Manager as tailor: A user-centered guide to managing creative teams* [PowerPoint slides]. SlideShare. https://www.slideshare.net/nmendonca/slides-mx-2008-margaret-stewart-presentation

The Ohio State University. (2021). *Understanding Instruction Modes*. Keep Learning. https://keeplearning.osu.edu/understanding-instruction-modes

Wong, D. (2007). A critical literature review on e-learning limitations. *Journal for the Advancement of Science and Arts*, *2*(1), 55-62.

APPENDIX

Table 1. Digital tools used to support charrette activities.

Digital tools	Key charrette activity
Zoom	used for synchronous kick-off and wrap-up events capping either end of the charrette; allowed faculty and student teams to record and share presentations, provide asynchronous access to content with computer-generated transcriptions (https://www.zoom.us)
Wonder	used for all synchronous, drop-in/drop-out advising sessions, and remained available to teams at all hours during the charrette (https://www.wonder.me)
Slack	facilitated informal, synchronous and asynchronous, direct, text-based communication and file transfer for individuals, teams, and the whole group (excluding industry colleagues) (https://www.slack.com)
Miro	used to facilitate synchronous and asynchronous, interactive, and static visual content during kick-off and wrap-up events, milestones; provided space for final deliverables (https://www.miro.com)
YouTube	provided teams with recorded Zoom presentations (https://www.youtube.com)
Box	used by student teams to submit milestone deliverables privately (https://www.box.osu.edu)

Table 2. Design Charrette Schedule.

SUN	MON	TUE	WED	THU	FRI	SAT
					MAR 5 (AM) PROJECT KICKOFF	
	(PM) ADVISING - TECHNICAL		(AM) ADVISING - TECHNICAL / DESIGN / PROJECT		(AM) *PROJECT MILESTONE 1* (AM) ADVISING - TECHNICAL / DESIGN / PROJECT	
	(PM) ADVISING - TECHNICAL		(AM) *PROJECT MILESTONE 2* (AM) ADVISING - TECHNICAL / DESIGN / PROJECT		(AM) ADVISING - TECHNICAL / DESIGN / PROJECT	
(PM) DELIVER-ABLES DUE	JUDGES REVIEW	JUDGES REVIEW	MAR 24 (AM) PROJECT WRAP			

KEY	SYNCHRONOUS GROUP SESSION	SYNCHRONOUS DROP-IN / DROP-OUT ASYNCHRONOUS	ASYNCHRONOUS ACTIVITY	AUTONOMOUS WORK DAY

Table 3. Design charrette objectives and stretch goals

Objectives (required)	**Stretch goals (elective)**
Each student team will design a temporary parklet concept to transform the on-campus courtyard. Concepts might address: • Shared space needs for individuals and communities (stakeholders) • Service offerings and experience • Products for individual or communal use • Products that are easy to disassemble and to store • Partnerships and collaborations that do or could occur in this shared space • A "stretch goal" from a project sponsor Parklet concepts could include elements such as furniture, space divisions, sculpture, and so on; elements may be physical, digital, virtual, or a blend.	1. Parklet elements make liberal use of large-scale 3D-printing 2. 3D-printed elements use a modular architecture 3. 3D-printed elements, including those that interface with non-3D-printed elements, can be assembled and disassembled with minimal additional hardware 4. Furniture elements that uniquely showcase IC3D capabilities

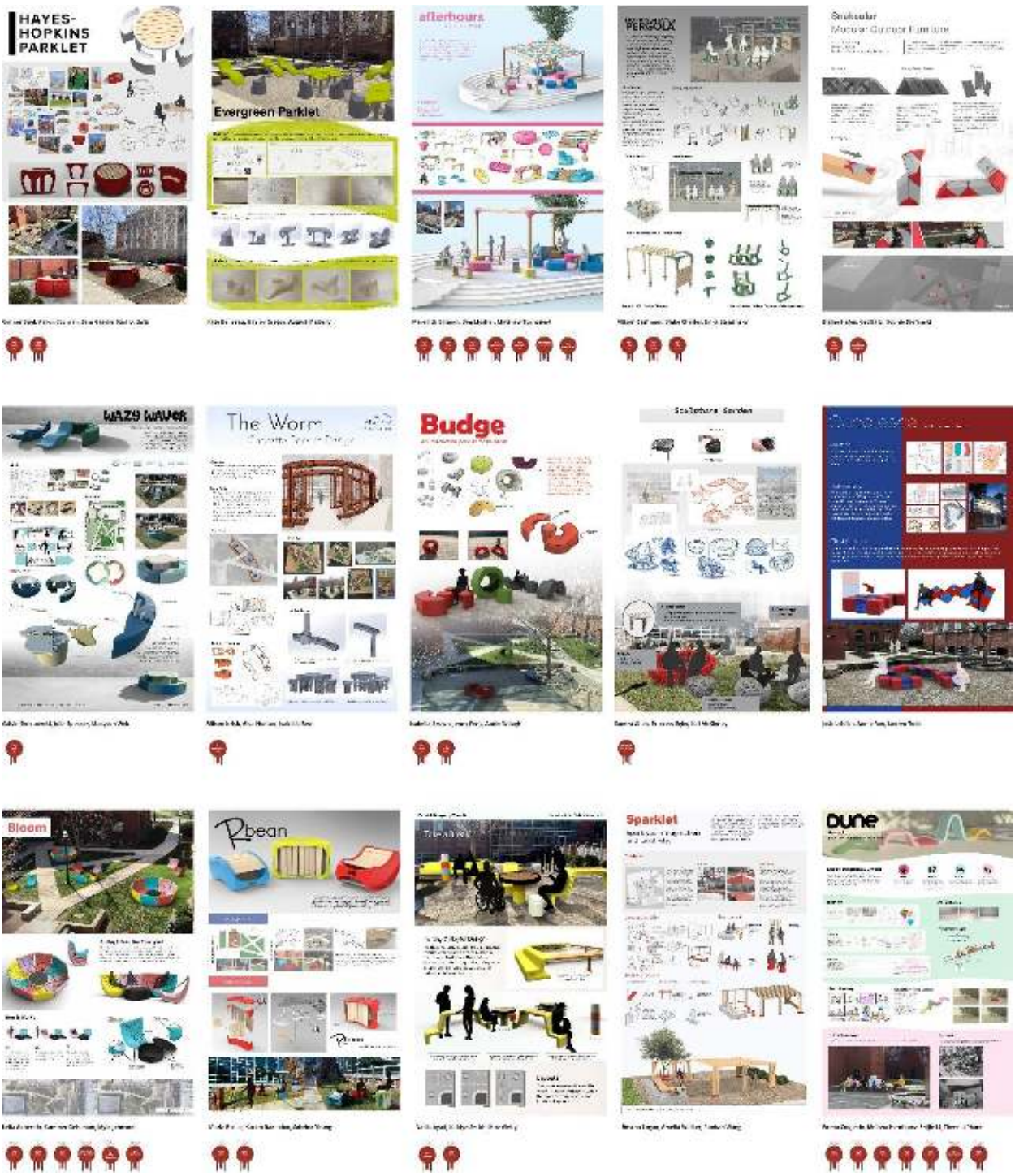

Figure 6. In this screen capture from an online gallery (Gümüş Çiftçi, Nickley, & Proulx, 2021), fifteen student projects are shown alongside accolades awarded by design faculty and industry partners.