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PLAY LAB: CREATING SOCIAL VALUE THROUGH COMPETENCY AND CHALLENGE-BASED LEARNING

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ABSTRACT
Play Lab was created by the School of Design and Architecture (EDA) in Tecnológico de Monterrey campus Querétaro, as part of a pilot education model called *Semester i*. *Play Lab* aims to bring industrial design and architect students together to tackle social challenges within a local community. It is a platform for social innovation, using *play* as a method for open experimentation, risk taking, and learning. *Play* was defined as a tool for activation, *Play Lab* was therefore a catalyst for positive social action in Mexican communities. A group of 23 students worked collaboratively with a community for one semester, starting in August 2016. The content of the traditional subject-based curriculum was transformed into learning modules which responded to the needs of a real social challenge.

Keywords: Competencies-based learning, challenge-based learning, co-creation, social innovation.

1 INTRODUCTION

Tecnológico de Monterrey is a private multi-campus university based in Monterrey, México. It is one of the most academically recognized universities in Latin America. In its effort to train 21st century professionals, the university launched an educational initiative called Model Tec 21, which seeks to develop the leadership capabilities students will need for the future (leaders with an entrepreneurial flair, with a human sensibility and who are internationally competitive). One of the initiatives launched through Tec 21 is *Semester i*, which is a new education model consolidating the academic content of one semester into an applied learning challenge. *Play Lab* was the platform designed by EDA to launch the opportunity of *Semester i* to the students. This paper will present an overview of the structure of the project and the main lessons learned.

2 METHODOLOGY

Semester i required a deconstruction and reconstruction of the traditional academic courses around a real-world challenge. It also required a transformation of the working culture for teachers and students. Traditionally the students work on projects with a pre-defined problem to solve, building understanding through applying knowledge and ending in a typically theoretical solution. Challenge-based learning involves an open non-theoretical challenge in which the students need to define the design opportunity, influenced by the real needs of their collaborators, then developing a solution that creates real impact. In project-based learning the teacher is the manager, in challenge-based learning the teacher is a mentor, co-designing and co-creating alongside the students [1]. The following section provides information on the methodology used to achieve *Semester i* objectives:

2.1 Defining the vision and objectives

Our first priority was to define the vision and Theory of Change [2]. This became the foundation on which we would design the programme. The vision statement for *Play Lab* was*: We will create a team of design and architecture students plus members of a local community, to co-create valuable, playable and sustainable designs that transform underused spaces within a local neighbourhood.* Our seven main objectives were; *1. To use 'play' as a principle within our methodology and design, encouraging the students to experiment and take creative risks in the pursuit of learning; 2. To build equal and cooperative relationships between students and community; 3. To openly share the design tools and methods used in order to build the community's design capabilities; 4. To create design solutions that the community want and need; 5. To design solutions that make a positive difference to*

people living or working in the community; 6. To design solutions that last beyond the scope of this semester; 7. To build entrepreneurial practice into both the design solutions and the participatory process. We created a Theory of Change to clarify the desired impact for five stakeholder groups: students, community, university, project partners, and wider society. Here is an extract as an example:

Table 1. Extract from Theory of Change

Who	Short term change	Medium term change	Long term change
Design & Architecture students	Develop all 6 capabilities outlined in our strategy	Increased access to opportunities after graduation	**Reflective and collaborative leaders, using their skills in socially responsible ways within their chosen careers.**
	Developing lasting cross-disciplinary relationships	Building participatory practice into future work	

2.2 Choosing our collaborators

To initiate *Play Lab*'s first project we formed a collaboration with Fundación Hogares, who became our main partners and funders. Fundación Hogares are a charitable organisation working with lower income communities across Mexico, promoting participation between people and the urban environment. In 2016 they partnered with a neighbourhood called La Loma (a suburb on the northern edges of Querétaro). La Loma has a population of almost 14,000 people and was built rapidly in the early 2000's as the population growth of the city placed strain on the availability of affordable housing. It experiences a number of issues related to social cohesion, infrastructure, financial investment, and neglected land. We believed the student's skills in design-lead research, urban analysis, creative ideation, and construction would provide value to La Loma and Fundación Hogares, as they were searched for answers to some of the community's complex social challenges.

2.3 Designing the model of innovation

The four month semester was designed around one main challenge divided into three stages. The first stage (weeks 1-6) was about open investigation, ethnography and trust building. The second stage (weeks 7-12) was about creative ideas development and collaborative prototyping. The third stage (weeks 13-18) was about building and implementation. A core principle of this structure was that the destination of the challenge remains unknown, until it is discovered. Therefore the design of the programme had to both invite open exploration, as well as define the parameters that ensure productive progress within a short period of time. There were delivery milestones at the end of each stage, aligned with the evaluation, and we drew on the convergent and divergent principles within the Double Diamond model design process model [3].

2.4 Defining the core competencies for the students development

The three stage structure of the challenge and the corresponding objectives of each stage, provided the information for which competencies the students would need to develop. These competencies were agreed by the university as the six main pillars on which to evaluate the progress of the students:

Table 2. Six core competencies

Participation	Build productive collaborative relationships with all stakeholders, engaging diverse groups of people in the process.
Framing	Identify design opportunities based on the needs of all stakeholders uncovered through research. Create a design brief with a holistic understanding of all human, social and cultural factors.
Creative confidence	Collaboratively generate creative ideas in response to the requirements within the design brief, transforming them into design solutions that satisfy relevant needs and opportunities for the community.
Prototyping	Build, test and iterate ideas through prototypes in both 2D and 3D, conducting viability, usability, and desirability testing with users. Use technical skills to visualise and build quality solutions
Communication	Communicate ideas and process with confidence and clarity -verbally and visually- to a range of different audiences.
Entrepreneurship	Develop sound business plans, enabling work to be locally built, sustained, and/or replicated in other contexts, or developed for other markets.

These competencies were also intended to reflect the range of skills and experiences that designers and architects would require in the professional world.

2.5 Defining the modules and the academic content

To meet the requirements of the challenge and to reach these competencies, we then aligned the academic content with the structure of the programme. We identified six existing courses across Industrial Design and Architecture that matched our structural and learning requirements of the

challenge and we worked with the relevant professors to understand how and when their knowledge aligned with this project. It was like deconstructing the theoretical course structure, and logically reconstructing it in bite-sized pieces around a new set of practical objectives.

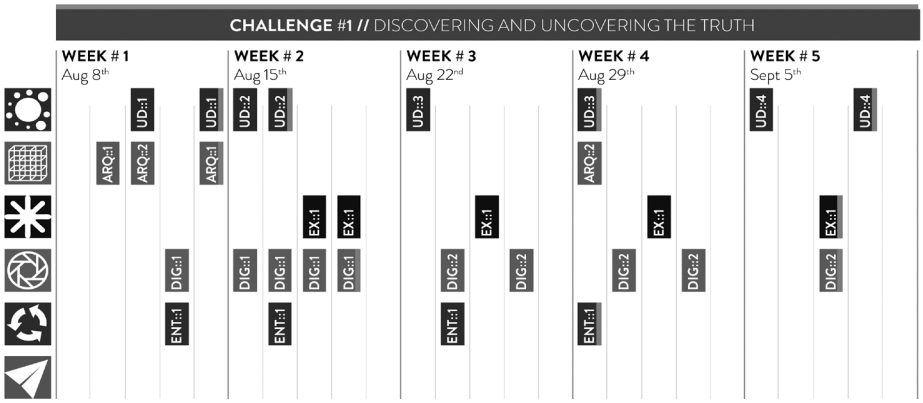

Figure 1. Example of module distribution within stage one, weeks 1 - 5

Figure 1 shows how the modules coded and then positioned against a programme structure. From the six courses, 23 modules were developed in total, these were delivered through a series of two hour classes (each block on this diagram represents a class). The modules ranged from six hours long (three classes) to 20 hours long (10 classes). On average the students had around seven academic classes per week, and the remaining time was dedicated to the needs of their project.

2.6 Designing the evaluation

We developed an evidence matrix for the end of the three milestone stages, to understand the extent in which the six competencies had been developed for each student. For example, with the Participation competency, we were looking specifically at the '*strength and depth of productive connections with the community'* and for a *'high quality practice for sharing design tools at every stage'*. The evidence for this was: *Ongoing participatory processes being adhered to (e.g. maintenance of meetings etc.); Proactive ideas for improving the relationship; Consistent, collaborative and positive interactions with community*. Our approach to assessment ranged from observational analysis, community-led and peer-led evaluation, online analytics and physical deliverables. We designed a co-evaluation system giving the students the opportunity to evaluate themselves and their team members. A core principle for the evaluation throughout was the value of feedback, and improvement. Their final grade was an amalgamation of all the work within the 23 modules (50%), and all the practical work they had done as a team on the challenge (50%).

2.7 Designing the internal structure of the team

The team of professors was structured around the logistical, academic, and leadership needs of the programme. There was a project and relationship manager who took responsibility for the logistics of the programme and the ongoing engagement of the client and students, and there was a creative lead who worked on the overall strategy of the programme ensuring quality and integrity. These two team members dedicated on average two days a week to the *Play Lab*. There was nine additional professors who were responsible for their areas of academic content and student mentoring. These professors dedicated between 1-3 hours per week to the programme. This is an average across an 18 week semester. The internal team needed strategies for ongoing communication and reflection. We set-up a WhatsApp group for day-to-day communication, and we committed to weekly meetings to share issues or ideas from the week, and for the weeks ahead. The student to staff ratio was high so it was important to keep the time spent as efficient as possible, ensuring this new model of working had longer term viability for the school.

2.8 Inviting students to join

The most crucial element to this programme was the team of students who would become the driving force of the whole experience. We needed to find students who were open to a new way of working and collaborating, with a desire to learn and a readiness to dive into the unknown. In the recruitment

strategy we created a video and Facebook page to communicate the vision for the programme. We also conducted personal phone calls and meetings with the students to answer their questions. We needed to provide choice to the students, if they joined the team out of a sense of obligation would they really be engaged in driving the work forward. We also needed to provide reassurance, this programme was a different way of working for them and many felt concerned the affect on their grades. The students ranged from 5th to 8th semester. In Tecnológico de Monterrey there are 10 semesters in one degree.

3 RESULTS AND FINDINGS

After four months working with La Loma conducting ethnographic and urban analysis, co-designing and prototyping ideas, the students set up a social enterprise called Barrio Chulo (which roughly translates from Spanish as beautiful neighbourhood), and designed a system called Ciclotaller (workshop on wheels) [4]. *"We wanted to democratize design"* the students told us, *"Instead of dominating the city with our own ideas, we want to give people the opportunity to design their own spaces, design the city they want"*. Barrio Chulo put their design and architectural tools and knowledge into the back of a tamale bike (a traditional and iconic bike selling tamales across Mexico). They painted it pink and created a mobile design school that gave people in La Loma the chance to be the designers of their own spaces. They travelled round La Loma running design workshops inviting people to imagine, design and the build their own public places. Inspired by the work of Live Projects in the University of Sheffield [5] and the Civic University by Public Works [6], the students took control of their learning experience and created a new model of community participation in Mexico. After interviews with the students and teachers involved, below are six themes that emerged from the lessons we learnt.

Figure 2. Images from the work of Barrio with Ciclotaller

3.1 Beyond the boundaries of my practice

Students and teachers were enriched by working across the barriers of their own practice. Urbanists worked with product designers, anthropologists with architects, social entrepreneurs with service designers. We had the opportunity to understand the wider relevance and the shortfalls of our own disciplines, and we learnt about the possibilities inherent in skill-sets outside our own. Design practice is often taught through the lens of single specialism, and when considering about the changing trends of work [7], it seems important to address cross-practice collaboration within design education. At IDEO (a leading international design strategy firm) they call for more 'T shaped people' [8] *"The vertical stroke of the T is a depth of skill…the horizontal stroke is the disposition for collaboration across disciplines…T-shaped people have both depth and breadth in their skills."* Tim Brown. What we all learnt and experienced by breaking down the barriers between us all was one of the most valuable aspects of the programme.

3.2 We learnt how to learn through uncertainty

The final destination for this semester was at first unknown to us all. It was a deliberate invitation to the students to identify the real needs and opportunities before designing a solution. Everyone involved in the project had different relationships to risk and uncertainty, so the programme needed to reassure people that there was a definite trajectory, with milestones in place to ensure the work

reached academic expectations at each stage. Typically in our education system we start projects with a clear vision for what will be designed. The students then respond to a pre-defined set of specifications. But designers and architects are increasingly requested to be part of shaping or transforming a brief and openly solving problems outside the traditional paradigm. Design strategy or design thinking [9] is a growing service within creative practice, and given the complex realities of today's society it seems essential to provide our students with the competencies to be social problem solvers, open to solutions that fall outside of their practice.*" The openness of the project kept us focussed on the integrity of our research, and we used our real understanding of La Loma to guide our decisions… we became the experts leading the way".* Quote from a *Play Lab* student.

3.3 Trust

With innovative practice comes risk, and inherently connected to this is *trust*. This project started to dismantle any unequal power dynamics between teacher and students. The teacher's role became more that of a leader, mentor and critical friend, helping students find their own voice and direction. The students created their own knowledge, building on the academic support of the programme, but becoming the experts of the experience. They started to passionately defend their work with justification for their decisions based on a genuine understanding of the context. With this project pushing everyone outside the boundaries of their practice we needed to learn quickly from each other, and be prepared to put what we knew behind what we needed to learn. Challenge-based education must be ready to dismantle traditional academic structures, and explore new paths. *"University creates these paths for us, in front of us, and we are expected to follow them… but what if there is another way, another direction, somewhere my teachers haven't been yet?... Should the teacher's path of experience the dominant path for the students to follow?"* Quote from a *Play Lab* student.

3.4 The power of the collective

Within this project there were 23 students and 11 teachers. A culture of collaboration was paramount to its success, but collaboration is not always cultural within our traditional system. We often teach within a paradigm of competition, even in group work there is still a drive to beat the other group, get the highest marks, show everyone you're the best. *Semester i* deliberately challenged this dynamic with the belief that to collaborate was a more important competency for the student than to compete. There was one project, one community, one goal, and a single team working together in a shared direction. We gave the students there own studio space, permission to create a mess inside it. They gave themselves a name and visual identity and started to understand their own strengths and weakness as a team. They self-organised and created different leadership positions at different stages of the project to provide effective decision making structures. The collaborative success of this project was in part down to the attitude of the students, but also down to the enabling and supportive role that the teachers played within the group. *"I think we were modelling what society needs, people who can work together, people who put their own ego aside and listen to others, people who build on each others ideas and made stuff better through collectivism"* Quote from a *Play Lab* student.

3.5 The motivation, to make a difference

The people in the community were the driving motivation for the success of this project. This project was based in the real world, it had the expectations of a client and a community of people behind it, and while the students were mentored and supported throughout, they all felt the responsibility. When asked about the driving force of this project, most students responded: *"It was the people in the community, we were doing it for them"*. Much more so than their grades. *"We didn't think about the grades, the proof of our success was in our work with La Loma... it was good to understand how the grades don't have to be the main goal of our education"*. The students were encouraged to take the participatory element of this project seriously, and the motivation they got from working with the community drove their commitment to succeed.

3.6 We learnt more than we thought possible

"I might not have learnt exactly what Tec wanted me to, but I learnt how to think, challenge, collaborate, listen… I am a better person" Quote from a *Play Lab* student. After running *Play Lab* for one semester we learnt that the value to the students personal and professional development far exceeded our academic expectations. The experience working as a self-managed collective with real

people in the real world, with real challenges to solve, gave the students a confidence and maturity that should prove invaluable for their future. *"I will never be the same again, something has been switched on in me"* Quote from a *Play Lab* student.

4 FUTURE WORK

Semester i will be rolled out as an education model across the whole of Tecnológico de Monterrey, and at EDA we are developing a long-term strategy for *Play Lab,* integrating it across every semester. Since December Barrio Chulo have remained together as a collective and continue to explore the idea of designers and architects as the facilitators and not the dictators of social change. We believe this model of challenge-based learning can transform how we teach and collaborate, and give students an opportunity to understand the real social value of their skills and knowledge. In addition to this, as outlined in Goddard E.J 2009 provocation for NESTA *Reinventing the Civic University* [10], these new education models also have a great power to create social value for the people and places outside the university walls, leaving us with the question: *what are universities for, and what influence can they have in tackling some of society's most complex and retractable challenges?*

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