Designing for and Facilitating Meaningful Making with Refugee Children

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ABSTRACT

The current political climate has seen the influx of refugees in many economically developed countries. Many of these children face challenges finding meaningful and enriching learning opportunities that foster authentic collaboration and engagement of their home cultures. One way that we aim to tackle this reality is through making. Accordingly, in this paper, we present observations from a workshop that implemented maker culture activities within a summer youth program for 16 refugees (5-17 years old).We examine the process of designing and implementing making sessions in collaboration with facilitators and children, as well as the facilitative moves that emerged throughout the program. We observe unique opportunities and points of discussion for 1) cultural bridging, 2) authentic language acquisition, and 3) meaningful making. Based on our findings, we discuss the lessons learned around embedding making in existing community spaces, the role of facilitation, and finally, the cultural contexts of making.

CCS CONCEPTS

• **Human-centered computing** → **Accessibility design and evaluation methods**; • **Social and professional topics** → **Cultural characteristics**; **Children**;

KEYWORDS

making, refugees, summer program, cultural context

1 INTRODUCTION

In June of 2018, the United Nations High Commissioner for Refugees (UNHCR) presented the figures for 68.5 million forcibly displaced people worldwide. Today, we are faced with the highest levels of displacement on record. Among this number, 25.4 million are refugees, and over half are children [11]. In December 2018, the Lego Foundation, Sesame Street workshop, and refugee aid organizations

announced their collaboration to create and implement play-based learning programs for refugee children in Lebanon, Jordan, Iraq, and Bangladesh [27]. This effort is only one of numerous others to help support the social and emotional development of children that have had to flee their homes. This paper aims to contribute to this growing need among the world's resettled children by examining the design and implementation of programs that offer meaningful and collaborative, play-based experiences for youth. We specifically seek to examine the role of facilitation in implementing maker culture activities in a summer program for refugee children. Therefore, our questions center on the ways facilitative practices emerged in real-time during the making sessions. We begin this discussion by touching on relevant prior literature that informed the design and facilitation of our program and then provide context to the study and methods used to collect and analyse data from the making sessions. Next, we describe the maker culture activity implemented in the program and the debriefs and hacking sessions that structured the collaboration with facilitators. Finally, we discuss our findings and suggestions for future work.

2 PRIOR LITERATURE

2.1 Facilitation and the Design of Equitable Learning Environments

Existing work demonstrates the promise of hands-on making, as grounded in Papert's Constructionism (1980), as a critical approach to bridging knowledge into concrete, shareable objects and developing STEM identities [10, 17, 24]. The process of making advances student-centered approaches based on authentic, meaningful experiences in the world [9, 26]. Furthermore, making in an afterschool setting can legitimize non-school based practices for youth who feel out of place in school [20]. However, maker identities and making fit within learning environments designed for and with certain types of makers in mind. In a review of Make! Magazine and the Maker movement, Vossoughi, Hooper Escudé (2016) highlight the ways a dominant narrative and image of making in the US disempowers working-class or vulnerable communities and reinforces a deficit-model of learning and teaching. Although making can serve to democratize access to the tools, skills, and discourses of power previously available only to experts [4, 13, 26], and broaden access to making and who participates [25], it succeeds in supporting equitable learning and teaching only to the extent that inclusive practices are embedded in the approach, facilitation, and design of a program. Therefore, understanding the role of teachers, and giving explicit attention to the pedagogical skills and practices that support making [25] is needed to emphasize the way facilitation is instrumental to positioning youth as competent thinkers, ascribing

learners with intellectual dignity, and reinforcing human values in making [18, 21, 22].

Facilitative moves play a critical role in introducing novices to informal learning environments as novices require a considerable amount of onboarding and facilitation before they can start hacking and learning by themselves [4, 26]. Furthermore, a focus on facilitative moves drives forward the need to contextualize learners and learning in multicultural contexts. Because learning in an afterschool space does not happen separate from teaching [20] we seek to highlight the role and moves of facilitators as it emerges and is enacted in learning spaces. We discuss the planning, design, and implementation of making for refugee children at a summer program and seek to uncover the facilitative practices that: 1) scaffold novice learning and making in an afterschool program, 2) reassess what counts as authentic or meaningful making and contributes to a transforming paradigm of who makers are and how maker identities are negotiated, and 3) examine the collaborative process of designing for an inclusive and meaningful making experience.

2.2 Vulnerable Populations

Traditionally privileged makers are upper middle class, White, and male [25]. Our work with refugee children seeks to challenge the traditional notion of makers and elevate the visibility of diverse cultural and social experiences in making activities. Refugees identities do not conform to a dominant narrative and lie within an "intersecting [constellation] of selves" [2]. Working with and designing making activities for vulnerable children necessarily challenges the notions of positionality, roles, power, and agency within learning environments [1, 5–7, 15, 25, 26]. So far, maker activities have been found to aid at-risk youth in place making and other critical processes for identity formation [20, 23]. Making demonstrates promise for engaging and positioning learners as creative designers with agency. This paper seeks to contribute to making in afterschool programs for vulnerable groups and expand the intersection between meaningful making and refugees through the lens of facilitation.

3 CONTEXT OF STUDY AND METHODS

Our work was done in collaboration with Global Aid Refugees (GAR, pseudonym) during the first three weeks of their summer youth program. GAR is a non-profit refugee resettlement organization in a large, Midwestern city in the United States. GAR works in collaboration with community partners and volunteers to aid refugees and immigrants through cultural adjustment and becoming self-sufficient in the United States. They offer case management, employment services, English education, and youth services to refugees. Our work emphasizes the potential for making at an afterschool program that serves refugee children to leverage their own interests and knowledge, while at the same time "fostering creative communities of practice in which young people can take the kinds of creative and intellectual risks that making requires" [16].

16 refugee children, between the ages of 5-17 years participated in the making sessions. Participation was voluntary and children could choose to attend some, all, or none of the sessions. The team of facilitators consisted of the GAR supervisor (male), two GAR summer interns (both female), and one of the researchers (female).

All three GAR facilitators identified as novices to using 3D printing pens and only one of the interns, a middle school teacher, had some prior experience and knowledge working with traditional LED lights on projects with her students. The program was held in a church building located in a diverse, low- to middle- class income neighborhood within walking distance from where the children live. The building contains a gymnasium at the topmost, third floor, and a large basement with collapsible tables and chairs, which are set up and taken down by facilitators for the afterschool program each time. Field notes were taken during all five making sessions with the children and debrief and hacking sessions with facilitators. Photos of the making and hacking sessions, and the final products, were also taken to support our analysis. Any references to children and facilitators utilize pseudonyms.

3.1 Activity: Make Your Own Board Game

We embedded our work in GAR's summer program through a series of five, two-hour making sessions. The researchers sought a highly collaborative relationship to support a community-based design research approach and utilize equity-oriented pedagogical strategies [3, 20]. From prior volunteer work with GAR, one researcher noted how eager and enthusiastic the children are to play board games after homework and tutoring. Therefore, our research team considered an activity framed around making board games. We started the sessions with traditional arts and crafts materials and introduced 3D printing pens and LED circuit stickers to augment the making. It is often the case that projects that utilize microcontrollers or other technological fabrication tools produce projects that cannot be taken home without compromising the product. To circumvent this, we chose 3D printing pens and LED circuit stickers as promising STEM fabrication tools to support making, but more importantly, result in projects that could be taken home in complete and sophisticated form.

The first session was divided into three parts. In the first part, the children were introduced to existing board games and played with their peers in self-selected pairs or groups. The second part was spent brainstorming ideas for their own games. Finally, the children self-selected into two groups, girls and boys, and were introduced either to the LED sticker lights or the 3D printing pens. The second session introduced the children to examples that demonstrated the possibilities and features of using the fabrication tools. The children then sketched their ideas and continued brainstorming their own games. Finally, they self-selected a tool to continue exploring and to practice their technique. The third session was a continuation of sketching, planning, hacking, prototyping, and making. Board games were made available at all sessions for the children to return to, should they need ideas or inspiration. The fourth session required sketches to be approved by facilitators before the final construction of games and pieces could begin. Iterating and prototyping elements for their games was encouraged. The final, fifth session saw the continuation of making and was an extended session that included dinner to showcase the games to their families, friends and other GAR staff.
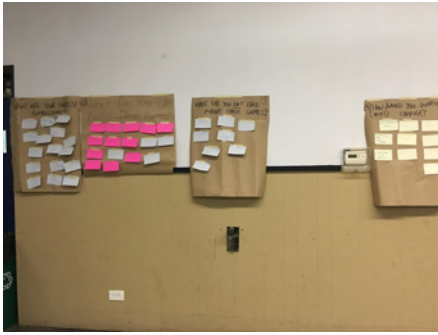
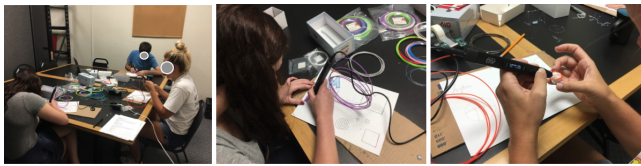**Figure 1: Brainstorming posters with ideas for making games.**

Figure 2: Facilitators learn to use 3D printing pens during a hacking session.

4 DEBRIEF AND HACKING SESSIONS WITH FACILITATORS

Only one of the three GAR facilitators, a middle school teacher, had some prior experience using traditional LED lights for her middle school class. The other two facilitators identified themselves as novices to LED sticker lights. All three GAR facilitators self-identified as novices to using 3D printing pens.

Six debrief sessions were held with facilitators and took place one to two days after each making session. Debriefs were key to planning the next making session as it provided facilitators the opportunity to reflect on the previous session, communicate any ideas or concerns related to the making, and plan for the next session. Debriefs contextualized the study and allowed us to obtain insight on the facilitators' thought processes and explore how both facilitators and children were responding to the collaboration and making. This made explicit some of the pedagogical skills, knowledge, and strategies the facilitators were intentionally employing around the design and facilitation of the making activity. In addition to debriefs, two, 1-hour long hacking sessions were held with the facilitators to introduce and familiarize them with the 3D printing pens and LED sticker lights. Insights from planning, hacking, and debrief sessions guided the open coding of field notes and the analyses following the end of the program.

5 ANALYSIS AND FINDINGS

We analysed the corpus of data (field notes from making sessions, debriefs, and photos of making and products) to explore the design of a summer youth program for refugee children and the role of facilitation vis-a-vis a making activity. Our analysis consisted of qualitative inductive coding to verify observations and discuss the lessons learned around: 1) designing and embedding a making

program into an existing community space, 2) examining the role of facilitation, and 3) highlighting the cultural contexts of making. An open coding approach was utilized and revised based on the local insights from facilitators and field note observations of the children engaging with the activity throughout the program. Our findings also draw on the responses to the making activity and the comments made by children and facilitators during the making, debrief, and hacking sessions. We discuss three opportunities that emerged from coding the making activity: 1) authentic language acquisition, 2) cultural bridging, and 3) meaningful making.

5.1 Authentic Language Acquisition

Authentic language acquisition was a consideration brought up early on during a planning meeting with facilitators before the program began. At this meeting, one of the facilitators broke down how the brainstorming in the first session would be executed. He explained that "four groups with a facilitator at each group could work" so that facilitators could "help write responses on post-it notes...because some of the kids have a difficult time writing in English". The facilitator pointed out that although the children participating in the program possessed an intermediate grasp of the language, writing English went hand in hand with improving their speaking. His suggestion for facilitators to assist with the writing was a concrete way to support language acquisition. At the final debrief, another facilitator expressed the desire to have had more structure to support the language acquisition. This facilitator reflected on the importance of having had the children formally present their games at the final showcase: "If they had presented their games they would have to formulate their thoughts...". The observation to have kids "formulate their thoughts" began a conversation between the facilitators around providing a space for the children to articulate their process with the purpose of sharing it with others. Inadvertently, their desire to support language acquisition also led to articulating a generative goal around making.

We found these discussions and sensitivity to supporting language acquisition evidenced in the facilitation for making sessions. There was a moment when I came across a facilitator asking a child: "Wait, OK, how do you say it again?". The child repeated a word in another language and the facilitator repeated it several times over again to himself. They were both laughing because the facilitator spoke slowly, hesitantly, and with some difficulty. The children also often spoke to their other siblings or friends in the program in other languages. There were many other moments when the facilitators exchanged stories with the children while making around the table together, and learning new words in different languages was a practice that emerged. Making opened a space for authentic language acquisition that worked bi-directionally. For example, while facilitators learned new words in different languages from the children, they also taught new terms and vocabulary in English. For instance, the technical terms and vocabulary related to the 3D printing pen and LED sticker circuits were introduced in the first several sessions and the children often asked for clarification of terms or repeated the terms to themselves. Others, curious and excited to use the tools, would pick up a 3D pen or a coil of copper wire tape and upon examining it closely, ask "When can we use this?" or "What is this?". Most of the children had a good grasp of English, but the

presence of other languages, and the support demonstrated by the facilitators, contributed to an open and welcoming environment [14] that supported sustained engagement and curiosity.

5.2 Cultural Bridging and Scaffolding

In Sessions 1 and 2 of the program, the children played board games, provided by GAR, to draw ideas and inspiration for making their own. After Session 1, we noted that some of the games were old, others were missing significant pieces, and there was a lack of variety in the skills and technique required from the games. Our research team brought in new games for the next session that engaged certain spatial skills, hand-eye coordination, and had unique features like a Pop-O-Matic®die roller. In subsequent brainstorming and sketching sessions, we observed children modeling their sketches and designs after the newer games. For instance, a group of four girls sat together at one table and took turns using the removable game board sheet from Trouble®as a template for their own games. In the context of playing and making their own games, the children required resources (i.e. a variety of games) to scaffold their brainstorming and design process. Example objects and facilitators' modelling skills and techniques also served to scaffold the making and learning. For example, one facilitator had created her initial, 'M', with the 3D printing pen during a hacking session. This example was referenced repeatedly throughout the program to show kids how 2D constructions could be "levelled up" into a 3D object using a stacking technique. One kid, whose name also begins with the letter 'M', used the example as a template, but remixed it using different colors and added a border around it. Scaffolding occurred in the form of verbal feedback [19], sample products, and both facilitators and children playing games together. Playing games with facilitators and with other kids provided a form of participatory scaffolding that supported conversations around how to play games (reading the written instructions and then speaking it) and catalyzed some of the ideas the kids had for making their own games. Apropos this phenomenon, one of the facilitators noted during a making session that bringing in more games was "helpful" and that he figured "a lot of the kids just don't know what kind of games are out there and what they can do for their own [games]". This comment supports the notion that modelling, either in the form of concrete objects or facilitator moves, scaffold making for novices to encourage interest and participation in making.

Yet, we found that the inspiration and ideas for games were not limited to access to resources, variety, and modelling, but also to the way the making activity was framed, or rather: not framed. For example, a 9th grader, Ray, joined the program late and missed the introduction to the tools and the explanations that contextualized the making activity. This did not deter him from sketching and making his own game using the materials provided. I came across one of the facilitators sitting with Ray during a session–a slight look of bewilderment on his face. He told me that he was trying to learn the game that Ray had made. Reflecting on this interaction in a debrief session, the facilitator said:

> It was funny...Ray put a game together at the last minute. He created a game that he played back home that was similar to "Sorry!"®. I was playing it with him–I was trying to play it–and
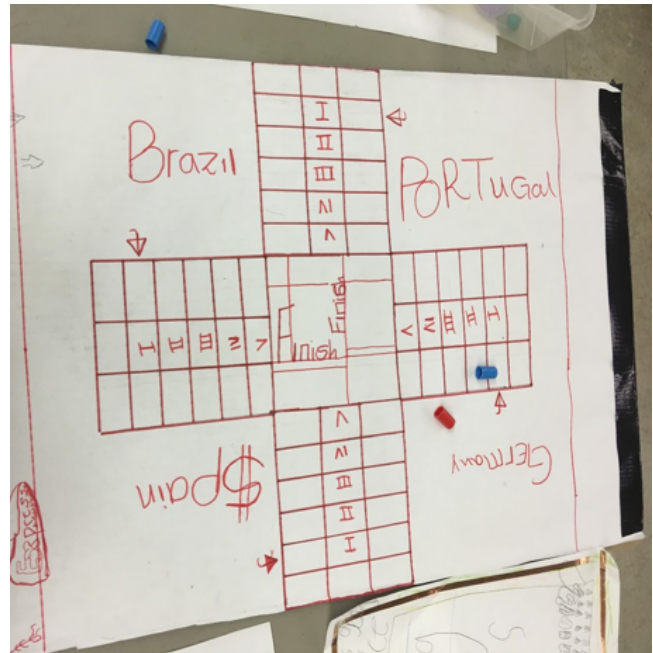

Figure 3: The game that Ray made and that Sunaan recognized.

> then Sunaan came over and was like "I love that game!"...I think seeing Ray from the Congo and Sunaan from Malaysia playing together was cool.

The facilitator continued to explain that the two boys are not only from different countries but are also in different grades. Ray is in high school and Sunaan was entering 7th grade. The facilitator reflected on the way the children from different countries interacted across grade levels and different cultural backgrounds. All three facilitators initially saw age differences as a potential barrier to collaborating and learning, however, one facilitator remarked in a debrief: "It was cool to see the tech *play a particular role* across the friendships" (emphasis ours). The cultural bridge (i.e. the collaboration and connection between people of different cultures) formed between the two boys, highlights the openness of the space that allowed them to find a point of connection, but also the affordance of making with traditional materials as well as technological tools, to bridge learners with different cultural backgrounds. By noting the "role of tech", the same supervisor recalled another example of an older child that "jumped in" to help another make his game pieces by taking turns with a 3D printing pen. This observation was enthusiastically affirmed by the other two facilitators. Although the children did not all share the same cultural background, their ability to find connections and collaborate was perhaps enhanced by their positionality as novices in the informal learning space. We found that this contributed to highly collaborative behaviors and promising seeds for a community of making.

Figure 4: Variations of the game Trouble®.

Figure 5: Games that incorporated sports into the design.

5.3 Meaningful Making

Designing for a meaningful making experience with the children required a highly collaborative relationship between the researchers and facilitators and the ability to maintain a flexible program. Our goal was to design a program with input from the facilitators to guide decisions. We were interested in surfacing local insight on the childrens' interests for a program designed to be relevant and equitable. We sought to leverage the local skills and knowledge of our collaborators, which required flexibility to adjust to how the children were responding to the activity and where their interests could actively guide the making. Therefore, despite prior discussions and a rough outline of the five making sessions planned, each session was contingent on the progress and response of the children. Debrief sessions were instrumental in discussing how the children were responding and where we could adjust and frame the making to support unique interests. Meaningful making in this context had to occur with regards to the four goals articulated by GAR, but was highly dependent on the "buy-in" and excitement of the children. For example, one of the facilitators suggested altering the wording of the workshop from "making your own board games" to "making your own games". This suggestion was made after Session 3 when the children began brainstorming and sketching their own games. The facilitator expressed concern that framing the making in the context of "board games" was limiting the children's ideas of games they could make: "Some of the games they want to make might not exactly be like the board games they played," he explained. As a making workshop embedded in a western society, the facilitator recognized the ways wording subtly erased games that reflected the diverse contexts of the children and the games they may have played in their previous home countries. This facilitative move served to include the existing skills, knowledge, and experiences that the children had around games from their home countries and served to open up the possibilities for what could be made. Many of the children subsequently incorporated elements of sports games played into the design of their game. The attention to letting the children's interests drive forward the making led to games that had personal connection and relevance for the children.

5.4 Long-term Interest and Engagement

There were unique moments in the program that showed potential for long-term engagement and interest in making. For example, an older participant in 8th grade, Chemu, arrived midway through the program and spent mo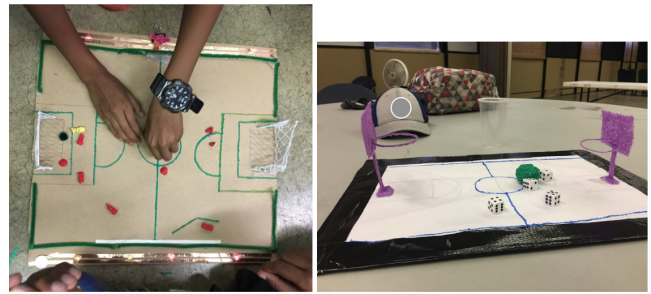st of the time working with a 3D printing pen to write out his own name, which he took home with him after the program. More striking though, was his later interest in some cardboard and felt material, which he took with him to the side of the space and where he began to work, sitting on the ground, to make a sandal. While he later abandoned the "sandal" project, we observed him working steadily and autonomously.

Finally, we observed another child, Kareem, taking his game apart after the final session. When asked whether he wanted to keep his game, he explained that he wanted to take home the soccer goals printed with the 3D printing pen to furnish his hamster's cage. These moments provide a glimpse into ways the children re-purposed, re-envisioned, and expanded their making practices and projects within and beyond the afterschool space.

6 DISCUSSION

This study seeks to highlight the practices that support equitable and inclusive making as identified and enacted through facilitation and the design of a making program for refugees. Our study demonstrates the potential for transforming the paradigm of what counts as making in areas of work with vulnerable populations, facilitators, and cultural contexts of making. Our goal was to engage refugee children in a meaningful making activity that introduced them to the tools, technology, and techniques centered around making their own games. We sought to support the goals of GAR as articulated by facilitators by embedding a series of workshops within the existing programmatic framework of the organization. The highly collaborative relationship contributed to the ways facilitation found articulation and *praxis* [12] therefore, careful attention was given to the local skills and knowledge of facilitators and children that shaped and guided the making sessions.

The planning and debrief sessions with facilitators allowed GAR facilitators to articulate the four goals of their summer youth program: 1) to be a place where children can continue learning over the summer, 2) for children to learn English and gain the vocabulary to talk about things, 3) to build new friendships, and 4) for the children to learn about their new community. Our collaboration with GAR sought to pursue these goals in addition to introducing a meaningful making activity and experience for the children. The interaction between the goals articulated by GAR, and designing a meaningful making experience, provides unique opportunities that highlight the cultural contexts of collaborative making. Debrief and planning sessions demonstrate an awareness of and attention to securing "buy-in" from the children through the local knowledge and skills

Figure 6: A sandal that Chemu began to make.

of a supervisor that had been working closely with the children and their families for their resettlement process. We found this emphasis closely linked to notions of relevance and meaningfulness of the making activity for the children.

In considering the contexts of informal or collaborative learning, we found that it was essential to consider the cultural context of making as well as the extent to which maker culture activities are made accessible to vulnerable populations. Cultural contexts cannot be divorced from the design of informal learning environments and making because learning is a deeply socially and culturally situated activity. The challenge remains for designers to build and evaluate systems that "aim explicitly at acknowledging the diversity of their users' cultural background and attending to a wider variety of needs and expectations" [8, 21, 22, 25].

7 CONCLUSION

This paper highlights the unique opportunities and points of discussion observed through a summer making program for refugees. We find that making holds potential for cultural bridging, authentic language acquisition and meaningful making through intentional design for culturally diverse learners, and through facilitation. Our findings also address the practices that support making within (and for) existing community spaces.

How does facilitation support and surface the existing skills and knowledge of learners? What roles and identities emerge in making and where is there potential to leverage making to support multilingual and multicultural learners? These questions are just a few that motivate maker culture activities as a democratic practice and form of engagement that extends beyond formal and informal learning settings. This study highlights moments from a study that embedded maker culture activities within a summer program. Our future

work seeks to further articulate themes of cultural bridging and identity development as mediated through maker culture activities.

8 ACKNOWLEDGEMENTS

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