Reflections and Facilitator Best Practices from a Collaborative Educational Live Action Roleplay Camp

Reflections and Best Practices from a Collaborative Edu-larp

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Abstract

This paper examines the importance of facilitation in youth constructionist learning environments, presenting best practices developed through an educational live-action roleplay (edu-larp) curriculum for middle school-aged youth. Drawing on four pilot deployments, we identify strategies for training facilitators in improvisation, role-play, and technical troubleshooting to ensure alignment with constructionist values. We detail how these practices were scaled and supported through the development of training materials and resources for a camp-in-a-box adaptation. Key findings highlight the need for active engagement in role-play during training, the value of adaptable resources, and the effectiveness of narrative framing in motivating STEM engagement. This work contributes to understanding how facilitation practices can enhance informal learning experiences and provides insights into scaling such practices effectively.

Keywords and Phrases: Edu-larp, Facilitation, Roleplay, Games for Learning

1. Introduction

The sociocultural approach to learning argues that learning is an inherently social practice, where learners are constantly "developing shared mental models with other learners that are appropriate for a given context" (Hammer et al., 2018). This approach aligns closely with roleplay, which is applied in a broad range of learning contexts – such as in immersive simulations for emergency first responders (Hammer et al., 2018), as a therapeutic intervention to practice communication (Rønning & Bjørkly, 2019), or to teach children critical thinking skills (Rashid & Qaisar, 2017). Roleplaying games are considered "affinity spaces that produce collaboration, community, and conversation" (Egenfeldt-Nielsen, 2007; Hammer et al., 2018). By

Fey, J. C., Robinson, R. B., Campe, S., & Isbister, K. (2025). Reflections and Facilitator Best Practices from a Collaborative Educational Live Action Roleplay Camp. Reflections and Best Practices from a Collaborative Edu-larp. *Constructionism Conference Proceedings, 8/2025*, 211–225. https://doi.org/10.21240/constr/2025/46.X

teaching perspective-taking, roleplay has been shown to reduce prejudice, encourage collaboration, and foster deeper engagement and connection with the material (Hammer et al., 2018; Rao & Stupans, 2012).

Live-action roleplay (larp) offers a physical, immersive approach to roleplay, often incorporating elaborate costuming and designated spaces for performance (S. L. Bowman, 2010). Edu-larp, or educational live-action roleplay, applies larp in educational contexts (S. Bowman, 2014), promoting empathy, problem-solving, creativity, and social cooperation (Maragliano, 2019). Larp has also been explored in HCI and design contexts as a tool for fostering creativity, collaboration, and embodied learning (Johansson et al., 2024) Like other experiential learning methods, edu-larp requires skilled facilitation to sustain its dynamic social and narrative frames while fostering learner engagement.

Constructionist learning, as described by Papert, emphasizes hands-on, collaborative creation of knowledge through meaningful projects (Papert & Harel, 1991). Edu-larp bridges real-world and simulated contexts to motivate learning through iterative, learner-driven experiences. This approach of creating context for constructionist learning not only immerses participants in narrative problem-solving, but also underscores the importance of facilitation in creating a socially connected and creative environment.

There are many kinds of both formal and informal learning experiences aimed at teaching STEAM skills through the use of games and game-like elements, such as Minecraft (Bar-El & E. Ringland, 2020). However, many of these experiences are neither collaborative nor utilize roleplay or larp. This presents a gap in the literature on the use of edu-larp as a means of teaching STEAM subjects, offering a rich opportunity for further research and community engagement. Recognizing the challenges of replicating edu-larp experiences (which we will elaborate further as the paper progresses), we focused on developing training resources that empower facilitators to independently create playful, learner-centered environments, culminating in the adaptable Camp-in-a-Box framework.

This paper examines the critical role of facilitators in shaping meaningful learning environments, guiding learners through technical and narrative challenges while fostering collaboration and experimentation. Building on a larger project exploring informal learning, this work shifts focus to facilitation strategies and educator training. We analyze initial facilitator experiences at our edu-larp camps, identifying challenges and best practices, then discuss how these insights shaped our facilitator training program. Rather than directly supporting deployments, we developed scalable resources to help facilitators run their own camps. By synthesizing facilitator reflections and pilot implementations, this paper highlights how facilitation enhances informal STEAM education and contributes to the Constructionism community. References to prior publications have been removed for anonymity.

2. Background

Our project team designed and implemented an informal learning experience that was focused on building knowledge and skills in the context of creating social wearables (Dagan et al., 2019), and creating and supporting a "computational community" wherein youth share resources and knowledge and provide support for one another (Kafai & Burke, 2014). The experience combines the teaching of design

and computation skills by leading campers in the creation of social wearable devices used within the live action roleplay activities. It places emphasis on social interaction while learning, and the solving of socially relevant technical challenges, as campers engage in shared larp "missions" that require group problem-solving through coding and social wearable design. This document outlines the camp's design objectives and general framework, with more details available in other publications.

The camp was designed to foster a collaborative learning environment and computational community, drawing on research that emphasizes peer-supported coding and meaningful social problem-solving to increase girls' interest in computing (Kafai, 2016; Kafai & Burke, 2014). The focus of the crafting activities to make playful and social wearables offers a unique and multidisciplinary approach to collaborative learning: bridging the teaching of design thinking skills (Carroll et al., 2010; Dam & Siang, 2018) and tech skills through the making of e-textiles (Buruk et al., 2019; Fey & Isbister, 2020). Our campers program Microbits using MakeCode (a block-based coding environment) with customizable attachments (e.g., LED strands, motors), depending on the wearable design. This unique combination of activities connects knowledge across social as well as personal dimensions (Kafai, 2005).

Prior work by the authors and collaborators on this project on Larp and social wearables – body-worn technologies designed to support co-located social interaction and collaboration – informed our design approach (Dagan et al., 2019; Segura et al., 2017, 2018). These technologies moved beyond gadgetry for its own sake, offering new ways for people to engage with narrative and augment one another's play. This led to our central premise: that an educational live-action roleplay camp centered on social wearable computing could invite learners to create socially meaningful designs that served both technical problem-solving and collaborative roleplay. Campers followed their interests to construct costumes, accessories, handheld props, and wearable robotics – designs that may stretch formal definitions of "social wearables" (Dagan et al., 2019; Buruk et al., 2024), but which functioned as on-body computing artifacts crafted specifically for in-game use (Fey et al., 2024).

Related projects have advocated for collaborative learning in computer science education (Nickel & Barnes, 2010) or exploring aspects of social emotional learning within e-sports (Cho et al., 2019), but none of these approaches utilize larp or roleplay. Projects such as those by Marquez-Segura et al. have explored larp as a design method, with participants co-creating technology used within the larp as a rapid prototyping activity (Segura et al., 2017, 2018). These activities, like Firefly, a social wearable that reflects connection between players, demonstrate the potential of roleplay as a platform for learning through iteration and collaboration (Vanhée et al., 2018).

This work aligns with Constructionism's emphasis on creating knowledge through hands-on, collaborative design experiences situated in meaningful contexts (Papert & Harel, 1991). Constructionist approaches have long demonstrated the value of active learning environments that foster creativity and agency through iteration and meaningful engagement (Kafai & Resnick, 2012). By combining social interaction, iterative problem-solving, and technical creation, the edu-larp approach supports learners in building connections between abstract computational ideas and their practical applications. For more information and details on the camp design, visit our website at https://anywear-academy.ucsc.edu/ and see our previous publications

(Fey et al., 2022, 2024, 2025). The Camp-in-a-Box adaptation was developed to scale these practices while retaining their constructionist ethos, offering facilitators the tools to cultivate playful and learner-centered environments across diverse educational settings.

3. Methods

Setting and Participants: The camp design and implementation was the product of partnerships between multiple organizations. The project team worked in collaboration with a non-profit company (who runs roleplaying camps) to design the camp experience and lead the free 5-day camp three times between August 2021-July 2022 at community-based locations. An additional camp iteration was run July 2022 on the local university campus with the project team partnering with a local youth engineering summer program. Improvements to iterations of the camp were supported by a non-profit partner that assisted with data collection and camp evaluation. Recruitment for the camp focused on middle school–age female-identifying youth, but all who expressed interest were able to participate, resulting in a total of 45 campers. The majority identified as female (37), with three nonbinary, three male, and two preferring not to answer. Ethnically, fifteen identified as Latinx, nine as multiracial, seven as Asian, seven as Black, five as White, one as American Indian/Alaska Native, and one preferred not to answer.

Data Collection & Analysis: Data was collected via interviews (conducted by the evaluation team) shortly following each camp implementation and from in-person observations by 1-3 people from the university and evaluation teams during each day of each camp implementation. A sub-set of 25 campers from the camp iterations participated in brief (15-20 minute) virtual interviews where they were asked about what they liked about the camp, what suggestions they had for improvements, if and how the camp was different than other coding-related camps/classes they have done, and what they liked about facilitators, including how the facilitators helped them engage in larping, creating wearables and connecting with them and other campers (i.e., creating community).

Eleven of the fifteen facilitators from the 4 camp iterations participated in 40-60 minute virtual interviews. The facilitator interviews focused on collecting data on their preparation (including training), observations of campers engaging in design-thinking, computing, building community – including any shifts throughout the camp and that they believe prompted those shifts – and suggestions for improvement. A total of 15 facilitator interviews were analyzed due to two of the facilitators being interviewed twice and one interviewed three times because of their repeated involvement. Observation data was collected through field notes, video and audio recordings, and daily group researcher reflections to support the interview findings. This data was originally analyzed by two researchers from the project's external evaluation team, with a focus on evaluating the camp's effectiveness in increasing camper engagement and interest in STEM. The results of that analysis are detailed in our prior publications on the four camp deployments (Fey et al., 2022; Fey et al., 2025). In the present paper, we focus specifically on findings from camper and facilitator interviews related to facilitation practices.

During the initial analysis, themes related to facilitation surfaced. To explore these more deeply, an external evaluator partnered with a member of the research team who had observed three of the camp deployments to conduct an additional round of

thematic analysis (Braun & Clarke, 2006, 2012) focused specifically on facilitation. The evaluator, serving as the lead coder, organized interview responses by prompt areas and generated themes related to facilitator behaviors, camper engagement, and community-building. These themes were collaboratively reviewed and refined, with transcripts revisited as needed to ensure clarity and consistency across data sources. This pairing helped balance analytic distance with contextual insight, though their shared focus on facilitation may have shaped how themes were interpreted.

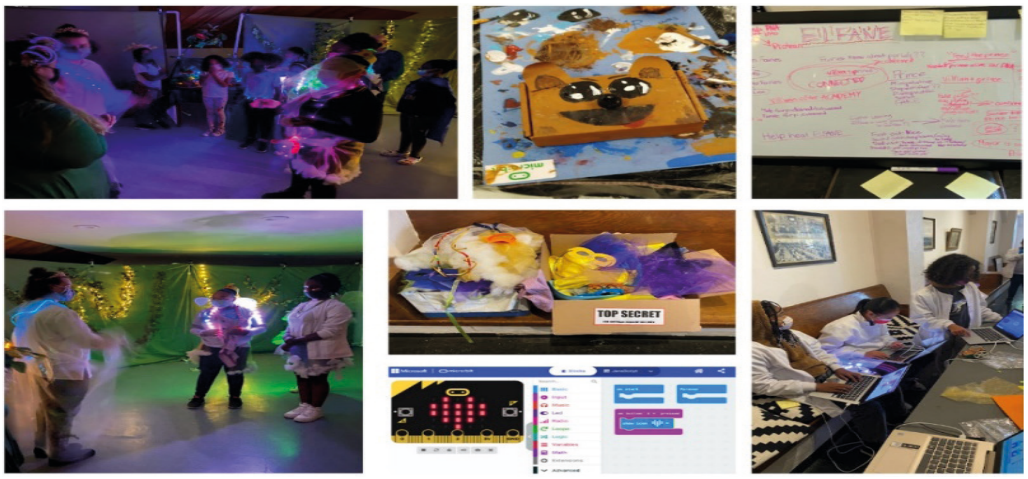

Figure 1: A series of images of various collaborative camp activities; one photo of campers collaboratively building social wearables, an image of one of the social wearable designs, an image of crafting supplies, and a screenshot of Makecode with a Microbit simulator.

4. Results

The progression of camp activities supported moving youth through an iterative design process and design thinking methodology (Carroll et al., 2010), as well as using the iterative process of imagining and creating. This intentional design, which included facilitators encouraging youth to collaboratively engage in the process of creating their social wearables to play in the larp, provided a foundation and ongoing space for the formation of community. The insights gained from facilitator experiences presented in this section served to identify the areas of focus for the practical training activities we developed afterward.

4.1 Collaborative Design and Problem Solving

The interviews and observations confirmed that campers were iterating and adapting their wearable designs throughout the camp based on the puzzles and problems they were tasked to solve within the larp missions. These design iterations highlight the value of youth creating flexible, personalized wearables and technology that depart from a prefabricated form-factor approach (e.g., robotics education kits such as Sphero) that is often utilized within similar camp experiences.

For a camp like this, it is imperative to model and encourage curiosity, creativity and imagination of which one facilitator described:

> "So having that MacGyver mentality. What do we have to work with? What can we stretch our imaginations to? Because when you get to a certain age, you're not thinking like a four year old. Your mind's kind of narrowed down a little bit more than it should be."

Facilitators were observed prompting youth to refine and adjust their wearable designs (e.g., add something new, apply what they learned from larping missions, look at other camper's projects). Campers noted how facilitators provided examples to help them move forward in their designs:

> "He showed me some cool pictures of how I can make the cape look like with the dark green and light green." and "...she just kept giving me suggestions, and I really liked that because then that got me, like a part of myself kind of into my costume, so that helped a lot."

To create more reliance and connection between youth, facilitators aimed to not "rescue" youth when they encountered a challenge, but instead encouraged them to find their own solution first:

> "Most of my interactions with the kids when it came to crafting [wearables] was, 'How do I use this tool?' or, 'Can you help me find this thing?' or, 'I need to solve this problem.' And my response is usually, 'You try it first and then I'll come and help you if you can't figure it out."' One camper noted their appreciation for the approach: "...like how they didn't just...They didn't just tell us what to do. They tried to make it more fun for us to learn and get it in our heads."

Facilitators also encouraged the youth to reflect and talk about what they were making and their design decisions throughout camp and during daily debriefs including changes they were making to address challenges they encountered:

> "He [facilitator] was also asking us questions about the camp. Like, the reviewing everything about the thing. Like, he told us, what we liked about today, a problem we faced, and something cool, if we got something to say."

One facilitator noted how they would support the iterative design cycle by saying things like:

> "Let's consciously think about costume design and how to integrate what we learned into our costume."

Facilitators encouraged collaboration and youths' reliance on each other, when encountering a challenge by asking them prompting questions such as "Is there a sound they [wearables] can all play?", "Let's work as a team to get it back together" and "Can someone help?"

4.2 Roles and Groups

To foster more youth-directed, collaborative creation and problem-solving, facilitators emphasized the importance of flexibility and being open to modifying original plans to accommodate youth moving at their own pace, group problem-solving and youth's unexpected contributions and solutions to challenges. This flexibility was apparent in how campers moved through activities with the guidance of the facilitators. Although some activities involved individual work, the camp design and facilitators allowed for fluidity of roles and focused on building a community of campers who inspired and supported one another to work together to create solutions to group challenges. Sometimes campers were observed working on computers or crafting in pairs, other times facilitators intentionally grouped youth in pairs or small groups to help them get to know each other and increase their engagement:

> "Well, I really didn't know anyone there until I met [camper name], because she was also pretty shy. Then, I think it was the second or third day, [facilitator name], she partnered us up, and then that's kind of how we started to get to know each other, and felt more comfortable doing things, and talking a bit more."

One camper commented on the value of working in different size groups:

> "I think I like both because you get to like learn from each person, but then you get to work with a bigger group and figure out things as a bigger group."

Different groups of campers took their own initiative in their approaches to collaboration to solve larp mission challenges. In one camp instance, all the youth liked to go on the missions together, gather clues and then all return to working on their wearable designs. In another camp, one person went into the mission to gather clues that they brought back to a group of peers who all worked together to program lights that were needed to complete the mission. One facilitator described how they modified their approach based on a group of campers who were excited to advance beyond the original coding instructional sequence:

> "Day one, they were exploring on their own, 'I want to add sound,' before we even got to those lessons. And so with those kids, and there were about six or seven of them, my role quickly changed from instructing to, 'If you need help, I'm here to support you. If you want to learn more about these things, I'm also here to support that. You let me know what you need and I'll help."'

And one facilitator believes that their campers, who worked as one whole group by their own choice, encouraged more wearable designs:

> "They didn't break into teams because they all wanted to go everywhere. I think that helped spur people on to keep creating different things so that they had a different costume for each place."

This flexibility gave youth the agency to engage with the camp experience on their terms, rather than through prescriptive roles or duties, as they worked toward the same common goals framed by the larp narrative (e.g., solving puzzles, creating a performance together using the Microbits).

4.3 Community

Facilitators actively supported campers to collaborate with each other to solve challenges in the larp, including designing and building their wearable, which supported the formation of community amongst campers. The growth of community was apparent in observations of campers asking for and offering help to their peers as they coded and crafted, and in later days of the camp, when they knew each other better, huddling together to collaborate and having fun. One facilitator shared:

> "I saw them talking and laughing together when they were taking little breaks or at lunch, and lots of occasions where even in game, like in a scene, they were laughing and having fun and really engaged, and trying to figure something out."

One camper talked about getting to know their peers as a result of facilitators prompting them to help others:

> "I didn't know anybody and other people didn't know anybody, but in the end, we would be stuck on something, or if we were done, the adults would tell us to help others...And then I would help them and then we'd kind of get along. So I guess that would help us make friends."

Daily debriefs not only encouraged collaborative design and problem-solving but also enhanced the feeling of community, as one youth pointed out when they reviewed and brainstormed together:

> "I think there was a big part of hearing everybody's opinions and connecting with everyone."

Both campers and facilitators noted the importance of icebreaker activities at the beginning of their time together – to get more comfortable larping, but also with one another. What also proved to be essential in building community was creating space for open/free time (e.g., lunch, breaks) where youth and adults got to know each other outside of more structured activities. A camper reported the following about how facilitators helped them all connect:

> "I guess in the games, like in the warm up games or the improv games, they would try to bring us together so that we could all hang out, I guess. And during lunch we would all be sitting outside in that little area that's outside, the workspace. And the adults would be a part of the conversation and try to bring everyone together."

One facilitator shared how she actively asked questions to help connect campers on common interests:

> "'Do you all do any art?' Well, some of the girls started talking about all of the different art they do. Some of them started showing each other their art and everything, which was really great."

In addition to campers connecting with their peers, it is important in an informal learning environment such as this for the facilitators and campers to connect to create a more comprehensive community. Reported by campers and observed by facilitators and the project team were the connections built through unstructured downtime where the adults and youth talked about life outside of camp and discussed common interests like music, movies, etc. Campers commented on these connections:

> "He just made a circle and we started talking about what's going on and what we have been doing this summer. And it just felt comforting; Because [facilitator name], me and her had similarities. We both like Disney and we both really like Just Dance;", and "That he's a really cool man. He likes to code like me. Because we're really good friends in that way."

Humor was often mentioned by campers as a way they connected with facilitators – either when they were "in character" or doing other activities. One camper shared a sense of belonging with the whole group that was fostered by humor and jokes by facilitators:

> "I felt comfortable when they would make me laugh. Well, they would make us laugh and tell jokes, because I kind of felt... not, well welcome,... but I felt I belonged there. Because when I don't laugh, I feel like I'm not welcome there. And I feel like I'm not a part of what's going on."

Facilitators noted the importance of modeling to increase camper engagement during larping:

> "And then you need a lot of people who are willing to be silly and act because if you are able to be silly with the kids, they are going to feel more comfortable engaging and being silly with you."

There were also some facilitators who welcomed bidirectional learning as could be seen when a camper taught a facilitator and peers how to crochet, leading to shared conversations and the incorporation of the crocheted item into the larping:

> "And they asked me how to make it so I just taught her. They were pretty funny and it was fun to teach them and they actually were interested, which was fun."

5. Discussion

The reflections aggregated in this paper from facilitators point the way to best practices within the context of the camp's design and implementation, in terms of facilitation strategies that contributed to the success of the edu-larp curriculum. These strategies – rooted in collaboration, improvisation, and iterative design – were instrumental in creating a learner-centered environment that aligned with constructionist principles of learning through active, hands-on participation (Kafai, 2005; Kafai & Burke, 2014). To scale these practices for broader implementation, we worked from this synthesis of facilitator feedback to incorporate key learnings into the development of training materials that directly addressed the challenges they faced, ensuring the strategies were grounded in real-world experiences and informed the iterative development of the camp-in-a-box framework. This camp-in-a-box is a stand-alone web resource that can be used by anyone to run their own version of the camp that we designed. In the next section, we present key best practices distilled from the facilitator feedback.

5.1 Key Best Practices

Modelling Playful and Collaborative Engagement: Facilitators consistently demonstrated curiosity, creativity, and improvisational flexibility, fostering a playful and inclusive environment that encouraged campers to take creative risks and engage deeply with narrative and technical challenges. This approach aligns with research on the value of role modeling in immersive learning, where facilitators' behaviors set the tone for collaborative exploration (Rao & Stupans, 2012; Rashid & Qaisar, 2017). By embodying the spirit of playfulness, facilitators helped reduce camper apprehension and fostered a space for experimentation and iterative problem-solving (Hammer et al., 2018).

Supporting Iterative Design and Reflection: Facilitators guided campers through open-ended design challenges, prompting them to iterate on their wearable creations and reflect on their decisions. This structured process mirrors findings on iterative design's role in promoting creativity and problem-solving in STEM education (Carroll et al., 2010; Kafai & Burke, 2014). Daily debriefs and reflective exercises helped campers connect technical learning to the overarching narrative, emphasizing the importance of linking hands-on tasks to meaningful contexts (Bowman, 2014; Maragliano, 2019).

Encouraging Camper Agency: By stepping back and allowing campers to solve problems collaboratively, facilitators created space for youth-driven learning, empowering participants to take ownership of their experiences. This strategy resonates with Constructionist principles that prioritize learner agency and community-driven knowledge construction (Kafai, 2005, 2016). Prompts and scaffolding encouraged campers to rely on their peers for support, fostering a sense of shared responsibility and collaborative problem-solving (Segura et al., 2018).

Balancing Technical Guidance with Creative Freedom: Facilitators struck a balance between providing technical support and allowing creative freedom, enabling campers to personalize their learning experiences. By linking technical tasks to narrative contexts – such as creating Familiars, a wearable companion character, with Microbits – facilitators demonstrated the power of integrating technical skills with storytelling to sustain engagement and curiosity (Dagan et al., 2019; Rønning & Bjørkly, 2019). This balance allowed campers to explore ideas freely while maintaining alignment with camp objectives of learning coding and developing design skills while building computational community.

6. Scaling and Supporting Facilitator Practices

After developing the facilitator best practices described above, from 2021 to 2023, we piloted facilitator training sessions across four educational sites, working with staff experienced in informal learning for middle schoolers, but largely unfamiliar with role-play. These pilots served as a critical opportunity to refine training methods informed by our key findings on facilitation, such as the importance of modelling collaborative engagement, supporting iterative design, and empowering camper agency. Researchers and experts were on-site to guide the process, observing whether and how facilitators could adapt to the narrative and technical demands of the Anywear Academy edu-larp curriculum. Researchers recorded observation notes during the event, and conducted a debrief at the end of each training session to collect feedback and information on how prepared the facilitators felt to conduct their own camp. In addition, semi-structured interviews were conducted by researchers with facilitators over Zoom before and after the camps, to help assess the successes and challenges faced by the facilitators. In the next two sections, we give an overview of the training approach and components, and then discuss the pilot sites and refinements that were made as a result of these pilots of the training.

6.1 Training Approach and Components

The training prepared facilitators to navigate three key areas: role-play, technical troubleshooting, and fostering camper collaboration. The training was conducted both in and out of character and extended from the Anywear Academy plot to provide connections and experiences for facilitators to draw on in the future during their camps.

- **Role-Play and Improvisation**
  Facilitators participated in carefully scaffolded exercises to build confidence in role-play. Activities started with simple icebreakers like "Two Truths and a Lie," moving toward creating characters and practicing scenarios from the curriculum. Character creation activities were used early to allow each facilitator to have a role they were comfortable inhabiting. Exercises were conducted both in and out of

character to create parallel experiences that helped to build confidence. These exercises demonstrated how narrative framing could encourage creativity and help facilitators establish an engaging learning environment.

- **Technical Skills and Familiar Creation**
  A central activity in the training was the creation of a "Familiar," a wearable companion character built using the Microbit hardware. Facilitators designed their own Familiar and programmed it within the camp's narrative framework. This hands-on process highlighted the integration of technical and creative skills, preparing facilitators to guide campers through similar challenges.
- **Integrated Practice**
  Facilitators rehearsed camp scenarios that combined narrative and technical elements. These sessions modelled strategies for promoting camper-driven problem-solving, encouraging creativity, and balancing structured guidance with open-ended exploration.

6.2 Pilots and Refinement

The training materials were tested at four pilot sites, each offering unique contexts for adaptation. These pilots revealed the effectiveness of linking training to facilitation best practices, such as modeling improvisation and encouraging collaborative problem-solving. For example, hands-on Familiar creation activities mirrored the iterative design campers would later experience, while scenario rehearsals built facilitators' confidence in handling role-play, covered in detail in (Fey et al., 2024). Although researchers were present to support these pilots, they served as a proving ground for refining materials that could eventually be implemented independently. By focusing on equipping facilitators to create playful and learner-centered environments, these pilots laid the groundwork for expanding the curriculum to diverse educational contexts. Below, we describe each pilot, its context, and the key learnings derived from its implementation.

Pilot 1: This pilot engaged 10 middle school-aged participants (9 girls, 1 nonbinary) from underserved Hispanic neighborhoods. The facilitation team included five individuals: three undergraduate students (one male, two female), a school district teacher, and a university programming supervisor. Training sessions introduced facilitators to role-play and technical troubleshooting through hands-on activities, such as crafting "Familiars", wearable companion devices tied to role-play characters. Observations highlighted the value of experiential training in building confidence, particularly in role modelling (Rao & Stupans, 2012; Rashid & Qaisar, 2017). However, facilitators identified a need for streamlined pre-training materials and additional role-play practice to feel fully prepared.

Pilot 2: Implemented in a community activity room within an apartment complex in an underserved Hispanic community, this pilot served 15 participants (7 girls, 8 boys) and involved six facilitators (three men, three women), recruited from community education roles. Training focused on integrating narrative-driven activities with technical troubleshooting for Microbit hardware. While crafting and role-play activities fostered high engagement, technical challenges exposed gaps in facilitator preparation for hardware troubleshooting. Facilitators adapted by creating new activities aligned with the camp's themes, reinforcing the importance of flexibility and learner-driven exploration (Hammer et al., 2018; Kafai & Burke, 2014). These insights led to revisions in training materials, including more robust guidance on technical support.

Pilot 3: This pilot tested a single-day modular adaptation of the curriculum with eight participants (five boys, three girls) aged 8–12, many of whom were identified as gifted. Two facilitators (one male, one female), both experienced in STEM education but new to narrative facilitation, led the camp. While technical tasks were well-received, participants expressed limited interest in role-play, underscoring the need for clearer integration of storytelling and technical challenges. This aligns with research on the role of narrative in fostering creativity and engagement (S. Bowman, 2014; Maragliano, 2019). Facilitators recommended additional resources to support embedding narrative elements into technical tasks.

Pilot 4: This pilot explored the feasibility of running the camp with a single facilitator and served three participants (two boys, one non-binary) in an after-school format. The facilitator, an experienced educator, underwent a two-day training, but faced challenges balancing narrative and technical components without additional staff. Observations suggested recruiting junior counselors or peer mentors to support activities, reflecting the importance of collaborative scaffolding in maintaining engagement and community (Kafai, 2005; Segura et al., 2018).

Feedback from the pilot sessions helped us refine the training materials further, showing how facilitator input directly influenced the development of practical tools. The diverse facilitation teams across these pilots, from undergraduate students to seasoned educators, provided a broad perspective on training needs and challenges. Key findings included the critical role of modeling playful engagement, promoting iterative design, and embedding technical challenges within meaningful narrative contexts. For instance, the Familiar creation activity exemplified learner-driven problem-solving (Carroll et al., 2010). Feedback informed iterative improvements to training materials, ensuring alignment with learner-centered goals and diverse educational contexts (Kafai, 2016; Rønning & Bjørkly, 2019).

The results of our pilots of the facilitator materials were influenced by the variability in facilitator experience and the contextual differences across pilot sites. While this diversity allowed for rich insights and demonstrated the adaptability of the curriculum, it also required researchers to adjust training delivery and evaluation methods to meet the unique needs of each setting. The presence of researchers during pilot implementations provided critical support and enabled detailed observation, but it may not fully reflect the challenges facilitators would face in completely independent deployments. These factors highlight both the strengths and complexities of developing a flexible, scalable framework for edu-larp facilitation.

7. Limitations and future work

As a result of piloting our facilitator trainings, we are currently developing a 'camp-in-a-box' website to distill these lessons. We believe this resource will enable others to successfully engage learners using the camp we designed. However, it is important to acknowledge key limitations of this work. The camp was only tested in one U.S. state, and campers and facilitators in other regions may respond differently to its content. While we included a variety of informal learning settings – such as afterschool programs, weeklong camps, and shorter sessions – with diverse staffing situations, the camp as designed may not be effective in certain contexts. For example, it appears critical to use a format that allows enough time for a sense of community to develop, either in one sitting or through continuous shorter sessions, and to maintain a consistent set of learners throughout the program. Finally, although we used a

mixed-methods approach to gather data on the camp's impact on learners, it may be valuable to incorporate additional data collection methods in the future to ensure the effectiveness of its core learning objectives.

8. Conclusion

This paper presents the design of a camp and highlights the critical role of facilitation in shaping educational outcomes at our edu-larp camps. Detailed facilitator feedback revealed four key skills essential for fostering successful constructionist learning environments: modeling playful and collaborative engagement, supporting iterative design and reflection, encouraging camper agency, and balancing technical guidance with creative freedom. These insights informed the development of training modules, which were piloted and refined to create a stand-alone online resource for facilitators. The findings emphasize that facilitation in these contexts is not simply "plug and play" but requires deliberate preparation and mastery of these nuanced skills to support collaborative, roleplay-driven learning experiences. We suggest this approach offers a valuable framework for others developing constructivist learning programs centered on roleplay and teamwork.

Acknowledgements

This work was made possible by a generous grant from the National Science Foundation (award #2005816). We are grateful for collaboration with the Game Academy, and for the evaluative and collaborative efforts of ETR. Thanks also to everyone who helped in the running of the camp.

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