# Examining the Impacts of the COVID-19 Pandemic on Library Makerspaces and LIS Makerspace Curricula

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## ABSTRACT

This paper outlines two synergistic analyses that engage with the themes of resilient futures and education related to the COVID-19 pandemic. First, we describe the results of a research study on how makerspace information professionals in higher education adapted their services in response to additional safety protocols and needs of their user communities. Second, we illustrate how preliminary findings from this research were incorporated into a case study on transitioning LIS makerspace course curricula from face-to-face to remote learning. By presenting both analyses together, this work contributes to conversations surrounding LIS curricula as it pertains to teaching and training information professionals for careers in makerspaces, while also contextualizing these adaptations within the larger changes implemented by academic library makerspaces in North Carolina.

## ALISE RESEARCH TAXONOMY TOPICS

pedagogy; online learning; curriculum; academic libraries; critical librarianship

## AUTHOR KEYWORDS

makerspaces; critical pedagogy; STEM learning; maker culture

## INTRODUCTION

The transition from face-to-face to remote instruction upended collaborative learning services in library makerspaces in higher education (Herker & Bingham, 2020). While this transition was distressing, it was equally illuminating as it exposed the vulnerabilities of library services that were designed to privilege users who can physically visit the space (Code et al., 2020). Specifically, the pandemic revealed the inaccessibility of many library makerspace services and prompted makerspace leaders to reexamine the needs of their users. This included new considerations for people without access to resources and technologies commonly available in makerspaces and the use of makerspaces to produce personal protective equipment (Coghill & Sewell, 2020; Smith, 2020). Moreover, LIS educators who teach courses to prepare students for careers in makerspaces were confronted with an interesting challenge: How do they teach a remote class on makerspaces without hands-on instruction, in-person collaboration, and without physically visiting a makerspace (Crawford et al., 2020)? In addition, and more importantly, pandemic stressors attributed to loss of life, isolation, and sickness were prevalent – the

classroom space was no exception.

This paper outlines two analyses that collectively engage with the themes of resilient futures and education. The first investigates how makerspace leadership in higher education adapted their services in response to safety protocols and the holistic needs of their user communities. The second is a case study of the pandemic's impact on the revision of an LIS makerspace course curricula from face-to-face to virtual instruction. This work contextualizes adaptations implemented by statewide academic library makerspaces while also contributing to conversation of LIS curricula as it pertains to teaching and training information professionals for careers in makerspaces.

## COVID-19 & HIGHER EDUCATION MAKERSPACES IN NORTH CAROLINA

### Methodology & Preliminary Findings

The first analysis examined the response and efforts of university makerspace leaders in North Carolina during the first six months of the COVID-19 pandemic. These preliminary findings emerged from of a larger five-year qualitative research program more broadly focused on equity and inclusion in academic makerspaces currently underway. This initial phase centered on a deceptively simple question, "What are the defining features of a makerspace?"

Researchers conducted 15 semi-structured interviews during fall 2020 for this phase of the research process. Two additional interviews from a previous pilot study was included. All 17 participants occupied leadership roles in their university's makerspaces in North Carolina-based institutions. The interviews (conducted over Zoom) averaged 30 minutes in length. To gain an understanding of the COVID-19 related influences on their makerspace, the researchers asked participants to describe changes, if any, they experienced since March 2020. These responses were documented to get a sense of the extent that the public health crisis impacted thoughts and efforts around makerspaces.

The data analysis for this project was informed by grounded theory (Charmaz, 2014). Each interview was transcribed and imported into the MaxQDA software program for line-by-line coding. Researchers produced memos and discussed emergent themes on a weekly basis. Preliminary findings and examples of participant responses are outlined in Table 1.

**Table 1**
*Preliminary Findings*

| Preliminary Finding | Example from Participants' Responses |
|---|---|
| Shifting from the collaborative, hands-on, and in-person features of their makerspaces' services, with a focus on safety and | "…I'm paranoid about this virus. I know the students are paranoid and so if we have to sacrifice some of the excitement…or the ambiance of the service in order to keep people safe, then that's something I'm willing to |

| | |
|---|---|
| adaptability. | live with." |
| Decreasing user attendance or completely halting in-person use of the makerspace. | "…[W]ith the restriction right now, we have a limited capacity in the room, so the number of students that come to the makerspace is about…one tenth of what [I was] used to. And also…only students granted access before [the pandemic]…have access to the building in order to get [in]to the makerspace right now… I would say the atmosphere now is very empty compared to what it was in 2019." |
| Spacing out equipment and/or integrating a reservation system to control the number of users in the space. This includes a pivot to a production services model where makerspace staff print and cut user projects. | "…[T]he amount of time we spent setting up our space when the pandemic hit – I had to go back in and redo everything in terms of creating socially distanced spaces [and] putting up barriers to create defined zones so that the students aren't next to each other." |
| Developing programming outside of the space that can be done safely in the user's home (e.g., creating and distributing maker kits, developing online workshops). | "We are trying to increase engagement by building what we call [make and take]…normally we would have people come into the lab and do things…[but] now we can't do that anymore, so we created these kits that they can kind of pick up and go to wherever they go and do it there." |

## COVID-19 & LIS MAKERSPACE COURSE CURRICULUM

The preliminary findings on the impacts of COVID-19 on higher education makerspaces in North Carolina provided critical guidance for the curricular changes of LIS makerspace courses. There were multiple and compounding curricular challenges triggered by the pandemic. In the following case study of a spring 2021 graduate-level makerspace course, immediate complications included translating a curriculum centered on the fundamentals of in-person tinkering, collaboration, and movement across a shared physical makerspace; raising course enrollment to accommodate more students; and leaving students without access to materials and technologies commonly available and free of cost through their university's makerspace. The distribution of course materials warranted careful thought and ongoing consideration of students' safety, including their distribution. The instructor was confronted with numerous variables to consider and decided to simplify the decision-making process. The impacts of COVID-19 on course curriculum was not isolated to assignments and learning objectives, but also influenced the morale and safety of students. Like the adaptations of library makerspace information professionals, the instructor pared down the learning outcomes of their makerspace course to two main themes: adaptability and connection. These two values served as anchors to rebuild the course objectives, assignments, and the cadence of the overall course.

### Adaptability

The instructor emphasized the notion that the home was, and continues to be, the original makerspace for humans. As such, students were encouraged to extend their capacity for creativity and curiosity from their homes and into the virtual classroom space. Adaptability was both a core value and a coping mechanism for the students and instructor to navigate a semester under the duress of uncertainty and fear. For example, midway through the semester both students and the instructor were experiencing a heightened level of Zoom fatigue. In response, synchronous class time was shortened while additional off-screen learning activities were implemented. The syllabus was modified regularly to meet the needs of the classroom community. Deadlines were extended. Assignments were removed or modified as needed.

### Connection

A fundamental value of maker culture is connection through communal learning and creation. Connection between students during the COVID-19 pandemic was of utmost importance, as many experienced heightened levels of isolation and mental health crises (Saltzman et al., 2020). In this context, connection served as a framework to design classroom experiences for meaningful and authentic engagement with colleagues. Examples include the following curricular changes, which sought to foster connections through the course:

- Zoom-based text chat check-ins were integrated throughout the course. Inspired by Dr. Amelia Gibson, the instructor asked students to change their Zoom names to "X" to provide anonymity. The students and instructor spent designated class time expressing how they were doing. This use of synchronous chat provided space to recognize shared grief and challenges confidentially.

- The curation and delivery of "maker kits" for students. Kits contained all the materials required for electronic textiles, macramé, sewing, virtual reality, and augmented reality course projects. Although students were not physically together, these materials provided a shared set of experiences. The kit also included a variety of snacks for added morale.

- Each synchronous class began with a low-stakes making project where students were prompted to create for 15 minutes. For example, one assignment prompted students to compose a fake marketing flyer on a topic they were passionate about. Students presented images and descriptions of their creations on a shared Google document.

## DISCUSSION AND CONCLUSION

The importance of these preliminary findings is abundant but can be distilled into two nodes. Collectively, these findings provide a sense of the material implications the COVID- 19 pandemic imparted onto in-person library services such as makerspaces. The pandemic urged

makerspace information professionals to articulate the key values of their makerspace and how their values aligned with, and departed from, the demands of the pandemic. Specifically, one central feature and value of makerspaces was threatened: face-to-face collaborative learning within a STEM-rich learning environment. This was a difficult realization because a pared down or halted in-person environment undermined key values expressed by the majority of research participants, who highly valued peer collaboration, learning through discovery, and hands-on guidance from makerspace staff. However, makerspace leaders adapted these values to align with virtual delivery modes. Practices that were developed in response to the pandemic – such as virtual consultations and the creation of maker kits for users who cannot visit the makerspace – are practices that can be sustained post-pandemic to ensure greater accessibility to services.

These preliminary findings provide urgent information in their own right; they offer curricular guidance for LIS instructors to consider when building out their makerspace courses during (and post-) pandemic. While not reflected in the interview participants' responses, the topic of using makerspaces in times of crisis to produce personal protective equipment and to provide emergency services was included in the class curriculum as well (Smith, 2020). The researchers conducting this study began to apply the burgeoning findings to the re-development of an LIS makerspace course, "Information Professionals in the Makerspace." The emphasis on the gap between resources needed and course project requirements in the findings highlight the importance of leveraging materials that may be sourced from the user's own home (Melo, 2020). This paper placed two analyses into conversation with another to impart a fuller understanding of the impact that COVID-19 continues to present to library makerspaces and LIS makerspace curricula.

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