

# Radical Placemaking: Utilizing Low-Tech AR/VR to engage in Communal Placemaking during a Pandemic

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**Abstract.** The COVID-19 pandemic has made the struggles of the excluded louder and has also left them socially isolated. The article documents the implementation of one instance of Radical Placemaking, an “intangible”, community-driven and participatory placemaking process, in Kelvin Grove Urban Village (KGUV), Brisbane, Australia to tackle social isolation during the COVID-19 pandemic. KGUV community members were engaged in storytelling and interactive fiction online workshops to create experiential, place-based and mobile low-tech AR digital artefacts. The article expands on the methodology which involved a series of online workshops to design low-tech AR digital artefacts using digital collaboration tools (Google Classroom, Slack, Zoom) and VR environments (Mozilla Hubs). The study’s findings confirm the role of accessible AR/VR technology in enabling marginalised communities to create connectedness and community by co-creating their own authentic and diverse urban imaginaries of place and cities.

**Keywords:** Augmented Reality, AR, Virtual Reality, VR, Urban Informatics, Pandemic, COVID-19, Community Building, Participatory Methods, Urban Imaginaries.

## 1 Introduction

*“Many words walk in the world. Many worlds are made. Many worlds are made for us...In the world we want, everyone fits.”*

– Ejército Zapatista de Liberación Nacional (EZLN) [1]

As we sit in the middle of a pandemic, communities worldwide face physical distancing measures to control the spread of the COVID-19 virus. Various preliminary studies indicate that the distancing measures are resulting in widespread mental health impacts and social isolation [2] and there is a growing need for alternative “virtual places” to bring the vulnerable together [3]. The pandemic has exacerbated existing disparities and injustices, resulting in many global social movements, such as Black Lives Matter (BLM). This article presents an instance of radical placemaking during COVID-19 pandemic where marginalised communities utilise digital tools to create low-tech AR artefacts on their lived experience of social justice issues and thereby engage in digital placemaking. Digital Placemaking involves digital technology and infrastructure, such as social media and public Wi-Fi in placemaking practices [4]. Radical Placemaking is

an activist practice that engages marginalised communities in utilising digital tools towards social justice and place-based activism [5]. The planning of the face-to-face workshops for this digital storytelling project began in August 2019 to tackle the social justice issue of social isolation experienced in Kelvin Grove Urban Village (KGUV), Brisbane, Australia. The project team transitioned the workshop's delivery to digital learning platforms and VR environments in response to the COVID-19 pandemic. This project aimed to utilise and evaluate Radical Placemaking interventions to counter the social justice issues of social isolation prior and eventually during the pandemic. This project demonstrates an alternative: "intangible placemaking" of memories and stories embedded in place through geolocative practices afforded by the bare minimum personal technology. It further demonstrates the use of open-source and low-tech tools by those who may be tech users but not necessarily experts. This article documents the methodology that supports the creation of low-tech Augmented Reality (AR) artefacts by marginalised communities and the use of VR environments for creating new communities during a time of social isolation.

The article begins with a literature review (Section 2), which shows a gap in conventional placemaking strategies that exclude marginalised communities, the need for alternatives in envisioning and historicising cities, and the role technology can play to do so. Section 3 outlines the methodology employed in the KGUV instance of Radical Placemaking and includes digital methods and technologies such as interactive fiction in creating the low-tech AR digital artefact. Section 4 then discusses the findings and learnings from research activities that explore the role of the immersive environments in placemaking during the pandemic. By learning to create these low-tech AR artefacts and engaging in digital storytelling as afforded by a smartphone and computer, this project provides a creative methodology of negotiating the digital divide by engaging marginalised communities through AR/VR technology towards new and alternate imaginings of cities. Section 5 concludes this article by reflecting on this project's key significance: the methodology for conducting communal, creative and digital placemaking during crises.

## 2 Literature Review

This paper positions itself within the field of urban informatics [6] as Radical Placemaking sits at the confluence of people, place and technology to explore how marginalised communities can create hybrid digital-physical urban experiences. The main research question proposed in this paper is "How can immersive experiences redefine the way marginalised groups engage in (radical) placemaking?" Given that the first case of Radical Placemaking was undertaken during the pandemic, this section reviews the concepts surrounding placemaking that led to the "radical" in placemaking, the experience of marginalisation and its exacerbation during COVID-19 pandemic, and the role immersive technologies can play towards inclusiveness of alternate and "other" imaginaries of cities.

## 2.1 “Other” Placemaking

Placemaking is the process where institutions and communities upgrade neighbourhoods and public spaces through physical and creative interventions [7]. There are two dominant kinds of placemaking approaches: first, the top-down approach, driven by city officials and developers to sterilise the city’s image to attract a particular demographic, new jobs, corporations and cultural attractions [8]. Minority groups and communities, who have their history, memory and symbolism embedded in the land, are excluded in these processes [4, 9]. The second type of placemaking approach is an organic process in which local communities modify place as per their living experience [10]. As communities intervene directly with what is lacking in the environment irrespective of city approval, it results in “place-hacking” (also known as DIY urbanism, urban acupuncture, tactical urbanism or urban guerrilla placemaking [4]). The scale of this varies from festivals [11, 12] to guerrilla and community gardening, graffiti/street art, skateboarding and parkour [4, 13]. These ‘place-hacking’ acts become sites of ‘ground-up’ activism [14] while echoing Harvey’s [15] ‘right to the city.’ Scholars continue to debate how DIY urbanism and ad hoc placemaking can overcome limitations of scale and impact. There are calls for an engagement with formal urban planning processes [16–18], while others have explored a reconciliation between top-down and bottom-up approaches [19, 20].

‘Ground-up’ activism also taps into the affordances of digital technologies, such as Ushahidi’s geo-locative mapping technology, to document social issues [21]. Thus, information and communication technologies (ICTs) change the way citizens stake claim to the city. The space created by bridging physical and virtual spaces through digital technology is called hybrid space [22–24]. When the human experience in the built environment is shaped and negotiated through technology in multi-dimensional and sensory modes, it creates the ‘Hybrid Place’ [25]. A body with a mobile phone in hybrid space and hybrid place is thus, a cyborg [26]; between physical and virtual space, always in motion in the physical space and virtually connected to others. When these cyborg assemblages engage in acts of placemaking, it results in digital placemaking [10]. When those excluded from conventional placemaking processes utilise digital placemaking to exercise their rights to the city, it is termed “radical” placemaking. The term “radical” comes from Freire’s radical/critical pedagogy [27, 28] where the lived experience and intrinsic knowledge of the marginalised are acknowledged, and from Ledwith’s position on community development towards social and environmental justice [29]. It refrains from making tangible interventions to place but instead takes the intangible, such as memories, stories and sensemaking, and embeds them into place through digital tools. Thus, the term ‘radical’ represents the use of critical, creative and hybrid placemaking methods by local and marginalised communities to voice place-based issues and advocate for social justice [5].

## 2.2 Cities of the People

Cities and public spaces are imagined with a vision of polity, liveability and inclusivity [30]. However, these spaces are typically imagined and executed in the imagination of the hegemony, leaving others excluded in these processes [31]. The processes inform

design and policy in the making of the city. For example, in the 1880s and well into the 1960s, Boundary Street in Brisbane demarcated areas that excluded Aboriginal people post 4 pm [32]. While the demarcation is no longer enforced, the street represents minority and marginalised communities' struggles towards different city dimensions as public spaces, housing, food, work, health services, education, and justice systems. Since emerging from Wuhan, China [33], the COVID-19 pandemic and the control measures to tackle the virus such as physical distancing [34] have exacerbated these struggles and inequalities [35–37]. An indicator is that poor and ethnic minorities are likely to experience higher mortality rates [38]. Reasons for the high mortality rate include overrepresentation in high-risk or essential employment, inability to self-isolate or physically distance, living in crowded places, immuno-compromised and at the mercy of inequitable health care systems [39–41]. In response to these stark and intensified injustices, several social movements and protests such as Black Lives Matter have taken to the streets to demand democratic governance, equitable services, public good and justice [42, 43].

Given that these struggles can fade from public memory and history is written by the victorious, it poses the question: how can those who are unheard and ignored broaden their struggles beyond the time-place logic? How can the diverse imaginations and histories of the cities of the marginalised be cultivated above and beyond that of the hegemony? Technology is one possible route in assisting humans in participating in creating alternate and future imaginations.

### 2.3 Technology towards Reclamation of Place

**Technology to Imagine.** With ICTs, the disciplines of architecture, design, planning, and engineering have changed how places and cities are imagined and how one can engage in urban imaginaries, i.e. ways to envisage city futures [44, 45]. Beyond the 2D CAD renders, both Virtual Reality (VR) – the immersive environments experienced through visual equipment [46] – and AR – the technological layering of digital information (images, sound, touch or haptic sensations) onto the real world [47] – are popular for mediating urban imaginaries due to their interactivity and sense of realism [48]. *SecondLife* is an example of a commercially and widespread VR environment adopted in urban planning and placemaking processes [49, 50]. However, these immersive imaginaries tend to reflect urban planning processes: the representation and the processes tend to be driven with a top-down approach [51], exclude the non-tech-savvy and present a certain kind of imaginary, that of the elite and the powerful, in the form of bedazzlement [52].

**Technology to Reclaim.** The non-elite will continue to challenge the status quo through tactics and subversions in the city [53, 54]. Further, as cyborgs, i.e. the body with a technological enhancement such as a mobile phone, walking through the city, they transform into the cyborg flaneur [55]. Pokémon Go, the popular smartphone-based AR game, provides the cyborg flaneur with the impetus to play, explore new places, and build sociality [56–58]. While this study finds inspiration in this pervasive game, it acknowledges that it does not allow for urban imaginaries. First, the game does not possess a strong narrative, which can inform attachment to place [59], one's realities

[60] and afford community care, healing and empowerment [61]. It allows the players to create their narrative while playing the game [62] but does not provide players with the agency to engage others by allowing them to create their version of “Pokémon Go”. Lastly, the game reflects spatial inequalities of the real world: it maps urban and affluent areas into the game instead of poor areas [63]. This study bears in mind the limitations of Pokémon Go. It explores how marginalised communities can utilise low-tech digital tools to create narrative-based and mobile-based AR experiences to depict alternative imaginaries of the city. The next section covers how it was conducted during the pandemic.

### 3 Methodology

The research’s main goal was to explore the use of immersive technologies in enabling marginalised groups to engage in radical placemaking. It further sought to investigate marginalised communities’ experience of developing immersive experiences towards digital literacy, empowerment, and community building. In the continuing spirit of radical pedagogy, the research process utilised participatory design and research methods to engage with members of an identified marginalised community [64]. With roots in Europe, participatory design (PD) involves the collective creativity of all stakeholders of the issue involved in the design process of artefacts or interventions [65, 66]. The making of the artefact involved participatory narrative inquiry where community members engage in digital storytelling through knowledge exchange, interpretation, exploration and sensemaking of lived experiences within the context of place or location [67, 68]. The workshop weeks were split between mandatory and optional online sessions. The mandatory online workshops on Zoom focussed on communal storytelling, and the technical aspects of making the artefacts were aimed for self-learning. The optional online support sessions were for both technical and storytelling aspects of the artefact. The sessions were designed to account for Zoom overload [69] and the flexibility required for the participants’ life situations.

Given the project’s sensitivity, the project team’s goal was to create a “safe space” online. It included selecting workshop facilitators ethnically and/or culturally similar to the participants’ background, procurement of participants’ written consent, openness and non-judgement of participants’ stories and the creative freedom to develop their artefacts with little interference from the workshop facilitators and primary researcher. Section 3.1 expands on the approach and digital tools required for creating low-tech AR digital artefact. The following section describes the context of the first iteration of Radical Placemaking titled *Chatty Bench Project* in KGUV on the issue of social isolation. Section 3.3 describes the original strategy to make the low-tech AR digital artefact before the pandemic and how it was modified to respond to the COVID-19 pandemic using digital collaboration tools and VR environments such as Mozilla Hubs.

### 3.1 Approach for Building Low-Tech AR Digital Artefacts

This study uses Twine,<sup>1</sup> an open-source interactive fiction tool created by Chris Klimas [70] in 2009, to build the low-tech AR digital artefacts. Interactive fiction is a genre of computer-mediated narrative, resembling a “Choose Your Own Adventure” story, in which the reader advances the plot by issuing command-based textual instructions (generally through typing into a keyboard) to the player-character [71, 72]. Twine is currently free to download, easy to learn and use, and used on low-end computers. It has a visual interface with a simplified coding language based on JavaScript. It allows for embedding digital media and exports to HTML to be hosted on various online sites [73]. Twine is well-known for its empathy games, where the players experience the game author’s personal stories [74]. Themes range from mental illness [75] and economic disparity [76] to low-tech AR experiences for archaeology [77]. Women and minority groups form most Twine-based game designers [78] disrupting who can make games, whose stories are told, and how they can be experienced [73]. However, while Twine features in research as an educational tool [79, 80] and adoption by the queer community [81, 82], there is little research about its adoption and impact by women and culturally and linguistically diverse groups.



**Figure 1:** ITML on majickat.itch.io<sup>2</sup>

**Prototype.** The low-tech AR digital artefact combines interactive fiction, digital storytelling and geolocation. During July-September 2019, a low-tech AR digital prototype called “In the Mood for Love” (ITML), see figure 1, was developed by the researcher using Twine. The artefact discusses personal experiences of anxiety and gender-based violence (GBV). The primary researcher picked up skills such as utilising the JavaScript window in Twine for enabling geolocation, embedding digital media, CSS styling, Geolocation API, and creative coding. Making the prototype informed the content development of the community workshop to create a low-tech AR digital artefact.

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<sup>1</sup> [twinery.org](http://twinery.org)

<sup>2</sup> Author 2019

### 3.2 Case study: KGUV, Brisbane Australia

KGUV, Brisbane, Australia is a mixed-use development that includes residential, commercial, educational, and recreational uses and the masterplan for KGUV, see Figure 2. The development was conceptualised in August 2004 by The Hornery Institute and Hassell for the main project participants Queensland Department of Housing (62% land ownership) and Queensland University of Technology (QUT) (38% land ownership) [83]. The spatial planning of KGUV follows the principles of “new urbanism”: an idyllic “village” built on an infill, brownfield site, with close connectivity to Brisbane CBD, a high-density development with walkability, mixed-use, sustainable infrastructure and a degree of self-sufficiency [84, 85].



**Fig. 2.** Kelvin Grove Urban Village Masterplan [83].

In order to build meaning and identity in the new community of KGUV, several placemaking activities took place such as artist Natalie Billings embedding historical texts in the footpaths around KGUV [86], the *Sharing Stories* digital storytelling project in 2006 [87], and the hybrid urban screen / mobile community engagement application *Discussion in Space* in 2008 [88]. In 2009, the community hub ‘The Exchange’ run by Communitify, a non-profit organisation, was formed to continue these placemaking activities, ensure community engagement and address the needs of KGUV’s diverse residents [89]. The proximity of KGUV to the QUT Design Lab, where the lead researcher is based, and relationships between QUT and local key stakeholders presented the perfect opportunity for Radical Placemaking in the form of the Chatty Bench Project.

**KGUV before the pandemic.** KGUV is a diverse community. 47.5% of the residents of Kelvin Grove were born in Australia and others came from China (11.5%), Saudi Arabia (4.9%), England (2.6%), New Zealand (1.8%) and India (1.8%) [90]. 54.6% of people spoke English at home and other languages spoken include Mandarin 11.2%, Arabic 5.7%, Cantonese 3.6%, Korean 1.8%, and Vietnamese 1.1%. The median age

of Kelvin Grove is 26 years: indicative of the student population residing there due to its proximity to QUT [90]. KGUV has affordable housing targeted at specific vulnerable groups such as people with disabilities, mental health issues and single parents. It makes for a transient and dynamic population experiencing education, social, and financial challenges. As per the 'Stakeholder Engagement in Kelvin Grove Urban Village' 2016 report, the KGUV community was in a nascent stage, and more had to be done to bring the community members together [91].



**Figure 3:** "Happy to Chat" sign on the bench outside of CommuniFy Premises to encourage people to talk to each other in KGUV.

During the Chatty Bench Project development, project partner CommuniFy identified social isolation, i.e. reduced social and/or physical connections with others [92, 93], as a key challenge in KGUV. Given the diversity in KGUV, residents experience varying degrees of social isolation for reasons such as a new migrant with limited social networks to language and cultural barriers in effectively engaging with others. The limited access to social capital (friendships) in KGUV [94] further limits their access to opportunities (such as recommendations for jobs or being able to ask for help) and local services (healthcare, education) [95]. Thus, social isolation is an issue of equity and social justice. As a response, CommuniFy put a 'Happy to Chat' sign, see figure 3, on a street bench used by community members to access CommuniFy's Wi-Fi. CommuniFy's tactic to activate the bench for conversation and social connection led to the first intervention of Radical Placemaking titled Chatty Bench Project (see section 3.3). It was deployed between August 2019 and October 2020.

**KGUV during the pandemic.** When the COVID-19 crisis arrived in Australia, it was regarded as a "Chinese" virus resulting in individuals with Chinese heritage experiencing acts of racism [96]. In March 2020, physical distancing measures and avoiding all non-essential activity such as leisure or retail shopping were implemented [97]. This resulted in economic inactivity and job losses impacting small business



owners [98], workers and students [99]. Further, KGUV has high-risk community members who are regarded as vulnerable to the virus such as senior citizens, immunocompromised or at risk to racism due to their ethnically diverse background. With limited access to support, KGUV community members experience aggravated social isolation [2]. Thus, the project team felt an urgent need for the Chatty Bench Project to take place during this crisis.

### 3.3 The Chatty Bench Project before the Pandemic

The Chatty Bench Project was planned with three phases: (a) Problem Identification; (b) Digital Artefact Creation Workshops, and; (c) Post-Evaluation. There are four categories of research participants involved in various capacities in the project and research phases: (i) Community Stakeholders; (ii) Experience Designers; (iii) Workshop Facilitators, and; (iv) Artefact Users. Community stakeholders are key stakeholders invested in the local community spirit and identity and belong to local institutions. The experience designers are KGUV community members who are likely to experience social isolation due to their low social capital, as explained in Section 3.2. They are referred to as experience designers as their engagement involves higher creativity levels, i.e. making and creating [100]. Workshop Facilitators supported the lead researcher in facilitating the workshops with the experience designers. The artefact users are the ones who experienced the artefact on the exhibition launch day.

**Original Workshop Strategy.** The Chatty Bench Project intended to deliver a community-building and digital placemaking exercise for those experiencing social isolation by making the low-tech AR digital artefact. The workshops were planned over five days to accommodate varying English speaking abilities and digital literacy levels. Each day breaks up into three types of activities: oral storytelling, digital storytelling, and using Twine, the digital interactive fiction tool, to make the low-tech AR digital artefact in Kelvin Grove suburb. The workshop content borrows from existing resources such as the storytelling activities of Rixon and Lloyd's [101] book "The Story Cookbook: Practical Recipes for Change", Twine tutorials available on Twine's Wiki page and Education page [102], Digital Storytelling from QUT's legacy of Digital Storytelling, and online resources for mobile storytelling [103]. The project would end with a launch of the artefacts and community get-together involving the experience designers, their families and members of the KGUV community.

### 3.4 Chatty Bench Project during the Pandemic

Due to the COVID-19 pandemic, the workshops and research methods transitioned to online deployment using digital tools such as Zoom, Slack, Google Classroom, and Mozilla Hubs and is detailed below.

*About the Participants.* Table 1 provides an overview of all participants engaged in the project and the research activities. Community Stakeholders were five individuals who participated in Phase A, who represented various stakeholders such as Communify, the

local Village Church, the university, the affordable housing provider, and the project's funding body – the KGUV Principal Body Corporate. There were three workshop facilitators – one identified as non-binary and the others as female – with drama, creative writing, and performing arts background.

**Table 1:** Participant types in the project and research activities conducted with them.

Phase	Participant Type	Participant No.s	Research Activities	Comments
Phase A: Problem Identification	Community Stakeholder	5	Interviews	Context setting
	Experience Designers	17	Recruitment	17 participants recruited with 1 drop out in Week 3 in workshops.
	Workshop Facilitators	3	Recruitment	-
	Experience Designers	6	Focus Group Discussion	Context setting
Phase B: Digital Artefact Creation Online Workshop	Experience Designers	16	10 week Workshop	Workshop Facilitators (3 no.s) deliver workshops sessions via Zoom to participants on Storytelling activities. Google Classroom provides content on Twine and Digital Storytelling for participants. Week 5 has Online Launch Party where Hubs by Mozilla is used as virtual meeting place for the event.
	Main Researcher	1	Voice notes	Observations made via using Otter app.
Phase C: Post Evaluation	Workshop Facilitators	3	Focus Group Discussion	Feedback on Workshop sessions, organisation and tools used in the project, particularly on Hubs by Mozilla.
	Experience Designers	6	Focus Group Discussion	Feedback on Workshop sessions, organisation and tools used in the project, particularly on Twine and Hubs by Mozilla.
	Artefact Users	7	Interviews	Feedback on AR digital artefacts and connection to place.
	Experience Designers	7	Interviews	Interpretation of worksheets and digital artefacts created.

All facilitators have migrant backgrounds and identify as persons of colour [104–106]. Due to the social isolation [107, 108] experienced thanks to the pandemic restrictions, the project opened up the recruitment of the experience designers to anyone who lived, worked or studied in KGUV. Twenty-eight individuals expressed interest to participate, nineteen accepted, and seventeen participants began the Chatty Bench Project. Sixteen experience designers completed the Chatty Bench Project workshops. They were all over the age of eighteen years, and four live in KGUV, six study there and others have an attachment to KGUV, e.g., having lived, studied or visited. There were four academics, ten university students and one creative professional amongst the sixteen participants. One of the academic was also seeking asylum.

In terms of ethnicity, five identified as Australian, one as European, five as South-East Asian, two as Middle-Eastern, one as South-American and two as North-East Asian. In terms of gender, there were twelve who identified as female, five who identified as male, and one who identified as non-binary. The experience designer cohort represents predominantly an ethnically diverse and transient group who have low social capital. With the pandemic restrictions, most of them lost jobs, did not

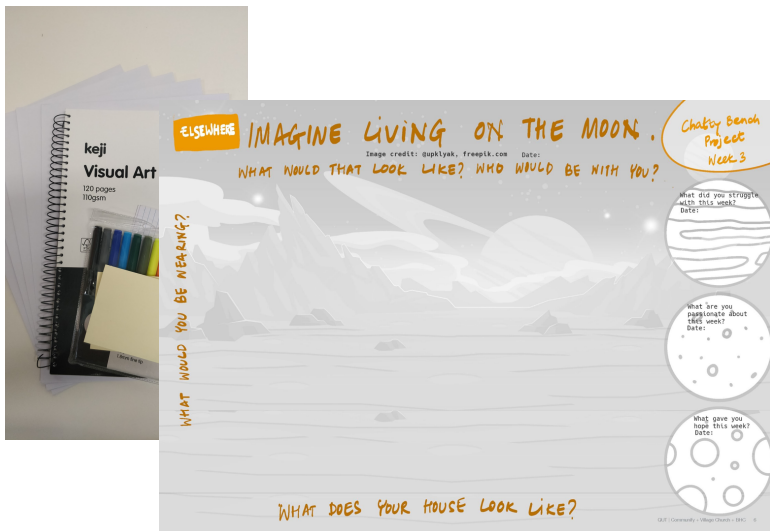
qualify for government support due to their status as international students [109], at risk of racism and lost face-to-face community activities which are entry points into the local community. Thus, the experience designers are a group at risk of heightened social isolation due to intersectional marginalisation [110, 111]. The project extended into the exhibition, and seven artefact users, five female and two male were engaged in interviews. Two artefact users only engaged with the artefacts online.

The workshop facilitators received a salary for their involvement. The project participants received the following incentives: meal vouchers for the first five weeks of the workshops, a mid-workshop gift voucher of A\$50 and a final gift voucher of A\$100 and a certificate on completion of all ten workshops. All research activities were approved by the University Human Research Ethics Committee. Written and verbal consent was sought and provided from participants before all activities.

**Phase A: Problem Identification.** This phase clarified the social justice issue of social isolation that the KGUV community faces through online interviews with the community stakeholders and an eventual online focus group discussions with the recruited experience designers. The online interviews with the community stakeholders included open-ended questions on their organisation's role in KGUV and the community's challenges. The experience designers were recruited through a widely circulated survey, which included questions on personal details (name, email, phone number), demography (age, gender), location in Brisbane and personal technology (computer, laptop, smartphone). Once recruited, the experience designers were invited to an online focus group discussion, which included questions about their current lives during the pandemic and their living experiences in KGUV. All online research activity was recorded. The video served as documentation, and the audio from the video was transcribed for data collection purposes.

**Phase B: Digital Artefact Creation Online Workshops.** This phase involved creating the location-based AR storytelling digital artefact by the experience designers with workshop facilitators' support.

*Online Workshops.* The online workshops' initial schedule was planned for six weeks ending in an online launch party. However, due to the support needed by experience designers to get comfortable with coding, the online workshops were extended by another four weeks with the final week, including a face-to-face exhibition. The online workshops followed a flipped classroom model to allow flexibility for the experience designers and their life situations. The participants were sent a package with a sketchbook, stationery, prepaid postage pack and itinerary for the workshops' weeks, see figure 4. Each week there was online course material released on Google Classroom, a mandatory online call (Zoom), two support calls (Zoom) and a physical A3 exercise worksheet for the experience designers to complete. The worksheets were coordinated with the weekly exercises, provided prompts for storytelling and encouraged participants to record their thoughts and feelings, see figure 4.



**Figure 4:** Left Image: Study package material. Right image: Worksheet of Week 3 where participants speculate about life on the moon.

Each week had a particular intent, see Table 2, with a video explaining the weekly exercises. At the end of each week, there was an assignment to be submitted, which was indicative of their progress. Throughout the workshop weeks, communications with the experience designers were maintained through Slack, email updates, and Google Classroom notifications. All online calls were recorded. The additional workshop weeks allowed for participants to get comfortable with the Geolocation API. Weeks 6 and 7 focus on the Geolocation API, Week 8 on preparing for the exhibition, and the face-to-face exhibition took place in Week 9. The actual date of the face-to-face exhibition depended on COVID-19 restrictions on local outdoor gatherings easing. This exhibition provided the chance for others (potential artefact users) to experience the low-tech AR digital artefacts in the different places of KGUV. The final low-tech AR digital artefacts were uploaded to Google Classroom for research purposes, and the experience designers retain the copyright of the artefacts.

*Week 5 – Online Launch Party.* Due to the uncertainty surrounding COVID-19 restrictions, the online launch day took place in Hubs by Mozilla or Mozilla Hubs. Mozilla Hubs is a free and open-source VR chat room accessed through a web browser [112]. It has been used for many online conferences and events and even allows users to create VR environments via Spoke, Mozilla’s online 3D editor [113]. For the online launch day, the project team decided that the VR environment would resemble the physical appearance of the KGUV with detailing of Musk Avenue, the main street, and parks such as McCaskie Park. The model of KGUV was first downloaded into Blender, a free modelling software, using a plug-in called Blender-osm [114]. It was then uploaded to Spoke. The model’s look and feel was intended to be non-photorealistic

with enough KGUV landmarks for the participants to orient themselves in the virtual space. The images of the experience designers' artefacts were uploaded and positioned in the virtual McCaskie Park, see figure 5. On the online launch day, the Mozilla Hubs link to the Chatty Bench Project was shared with the experience designers. On entering the space, instructions to navigate, select an avatar and rename themselves were repeatedly shared via chat.

**Table 2:** Workshop Structure and intent.

Workshop	Theme	Intent
Week 0	Get Started	Introduction to different tools, prototypes and Twine games, and downloading necessary software on personal computers/laptops.
Week 1	Learn	Introductory video of Twine, development of potential narratives for low-tech AR digital artefact and identifying places of meaning in KGUV.
Week 2	Design	Development of narrative structure and use of CSS in their Twine story.
Week 3	Iteration	Embedding of digital media and advanced programming in Twine.
Week 4	Testing	Introduction of the Geolocation API into their Twine artefact in order to augment identified locations with digital media.
Week 5	Online Launch Day	Experience designers faced challenges with programming and embedding media in Week 4. The project team then decided to leave out the Geolocation API in preparation for Week 5 to allow experience designers to complete the narrative structure of their Twine stories. The Online Launch Party was conducted via Hubs by Mozilla, the free VR environment.
Week 6	Geolocation	Geolocation API: programming and testing
Week 7	Geolocation	Geolocation API: programming and testing
Week 8	Exhibition Prep	Low-tech AR digital artefacts uploaded to project website and other prep necessary for exhibition.
Week 9	Face-to-face exhibition	Face-to-face exhibition took place in the community markets where artefact users experienced the artefacts. This was followed by a community barbecue in the neighbourhood park.

**Phase C: Post-Evaluation.** This phase was used to understand the workshops' efficacy in digital literacy, creative writing and creating the low-tech AR digital artefacts. It further sought to understand the impact of the artefact towards the experience of KGUV via digital placemaking. The phase began with an online focus group discussion with the workshop facilitators to understand their experience of engaging in these workshops, the online launch day and their views on whether project seasoned social connections. On completion of the exhibition, there were online interviews with artefact users, experience designers and community stakeholders. The artefact users shed light on their experience of the artefacts and how they experienced KGUV. The interviews with the experience designers informed their stories' meaning and how the interactive elements in their story enhanced their experience and understanding of other participants' stories. There was also an online focus group discussion with experience designers to understand their experience of engaging in the project, creating the artefact and their views on whether they experienced interconnectedness and social benefits. All online interviews and focus groups were recorded, and all audios were transcribed for data collection purposes.



**Figure 5:** Mozilla Hubs Virtual Environment fashioned on KGUV. The green strip highlights the exhibition space of virtual McCaskie Park.

**Analysis.** The research generated a mix of audio-visual and paper data. The audio from the video recording of the online interviews, focus group discussions, workshop calls and online launch day on Mozilla Hubs were transcribed using the AI transcription service called Otter.ai. The researcher also created voice-notes during the different phases, which were also transcribed using Otter. All the transcriptions generated underwent thematic analysis [115, 116]. The content on Slack, the low-tech AR digital artefact and the worksheets underwent content analysis. The data is analysed for patterns which are categorised into themes or codes. The codes are then clustered as “units of meaning” into broader categories creating connections between the events, workshops, data and artefacts generated in this project. This paper reports on the findings from Phase C focus group discussions with workshop facilitators and experience designers (see Table 1) and the Week 5 Online Launch Party video recording. The related data and findings detail the experience of developing the low-tech AR artefact and utilising VR environments during the pandemic and is presented in Section 4.

## 4 Discussion

The main goal of this article is to provide a methodology of utilising immersive technologies towards communal placemaking during the pandemic. The following themes emerge from preliminary findings: Immersive Environments for forging Community, Immersive Environments for Radical Placemaking and Immersive Environments for Everyone’s Urban Imaginaries.

#### 4.1 Immersive Environments for forging Community

*I personally feel included (now)...even though I'm the only person who goes to McCaskie Park and like spend seven hours, sitting alone, eating my own lunch from my lunchbox, I still feel like the community needs me, the community, the trees need me. This is the kind of feeling I have.*

*Making of the low-tech AR digital artefact.* KGUV, in its conception, was assumed to conjure a new, vibrant and diverse community. Well-constructed buildings and the physical proximity notion of a “village” do not guarantee community engagement: there needs to be a driver for community engagement [85]. COVID-19 pandemic was the unlikely and significant driver for participants joining the Chatty Bench Project due to COVID-19 restrictions, available time, loss of employment, and consequent desire to connect with others. The pandemic forced the workshops to go online, and engagement took place via digital tools. All participants spoke of the project as being “special” because it provided an opportunity to learn new skills, learn from different cultures, experience connection to others, feel part of a community, and feel listened to during this challenging period.

*Mozilla Hubs.* With the environment modelled as per KGUV, the online exhibition took place in virtual McCaskie Park of KGUV. The response to the virtual environment was mixed, see Section 4.3. Despite the challenges of navigating Mozilla Hubs, many participants expressed excitement in the virtual space, now wanting to meet in real life. Real-life interactions of greeting one another and the excitement of seeing a “known face” seem to have been simulated unintentionally in this environment. With everyone in avatars in Mozilla Hubs, they were recognised with the name-tag floating above their heads and the excitement of recognising was noted in the auditory conversations. One participant remarked that they felt safe in this virtual space because they “knew” everyone.

#### 4.2 Immersive Environments for Radical Placemaking

*I guess I've got more associated to it (KGUV) now. So if I go to specific places, I think of them more, like if I go on a walk with my dog, I'm like...that's where the barbecue and exhibition was. And you just start associating things more...So yeah, now Kelvingrove has more of a relationship to it, I suppose, like an emotional connection.*

*Making of the low-tech AR digital artefact.* The project emphasised the value of place in storytelling and allowed for several associations and attachment to existing physical. All participants spoke of the online workshops as “safe space” to meet, create and discuss their artefacts due to the openness and trust created. The conduct of the project drew associations with being in a university course. Further, the making of the sixteen low-tech AR digital artefacts strengthened the participants' connection to place, i.e. KGUV and provided new meaning to it.

*Mozilla Hubs.* All participants preferred meeting face-to-face instead of the virtual environment of Mozilla Hubs. Nevertheless, they felt that Mozilla Hubs was necessary during the pandemic and a milestone in the project as it presented a break from the regiment of the online calls. The virtual environment presented a “cartoonish” KGUV with landmarks and virtual McCaskie Park in keeping with bandwidth requirements. Two workshop facilitators saw potential in it as a virtual art gallery space and participants knew it was KGUV when the researcher told them so.

### **4.3 Immersive Environments for Everyone’s Urban Imaginaries**

*I really loved the Mozilla hub even though I was so ignorant in it...and couldn’t speak to anyone. And it was floating up everything I was flying. Like even though I had no idea, I really love just being in a new space with familiar people and, and seeing like the art kind of gallery. I really liked that experience, I wish that I’d figured out how to land it better in the beginning so that I would be able to talk to everyone.*

*Making of the low-tech AR digital artefact.* The Chatty Bench Project team sought free and open-source tools such as Twine and Mozilla Hubs. Institutional resources such as the university corporate/education accounts for Zoom and Google Classroom enabled the workshops’ online deployment. All participants voiced that the making of the artefact was fun and empowering as they learnt new skills. One female participant remarked that the coding made her feel empowered and broke the perception that coding is meant “for boys.” For others, participating in online calls, writing their story and tackling geolocation API increased their self-confidence. Keeping the tools low-tech brought complex, and diverse stories of sixteen lived experiences in KGUV during a pandemic.

*Mozilla Hubs.* Mozilla Hubs received a mixed response in terms of usability due to participants’ challenges to navigate it. Three experience designers and one workshop facilitator expressed not “enjoying” the environment for this reason and with one attributing it to not being a gamer. Two workshop facilitators found it fun despite the navigation issues. Despite the challenges, all participants felt it was better to have it than not. It provided a digital meeting place for everyone and provided an opportunity for experimentation and playfulness (for example, selecting an avatar) and allowed real-time global attendance.

## **5 Conclusion**

The Chatty Bench Project is an initial case of Radical Placemaking where AR tools are utilised to provide a voice and visibility for those excluded from conventional placemaking processes. With a low-tech AR prototype in hand, the project was planned for KGUV and its current challenge of social isolation. This paper documents the original methodology planned for working with the community before the pandemic in



the form of face-to-face workshops. With the COVID-19 pandemic, the workshops and engagement strategy were amended and went online. Sixteen low-tech AR digital artefacts were created, and the face-to-face exhibition took place in October 2020 pending physical distancing restrictions. Initial discussions around immersive technologies in the project's findings point to its potential towards community-building, place attachment, meaning-making, storytelling, accessibility and affordability based on anecdotal learnings and experience of the project participants. The research's intended outcome is to create an open-source toolkit based on this low-tech AR/VR approach to digital placemaking.

The pandemic put the lives of marginalised communities and their multiple realities, alternative histories and hidden histories at risk. Further, the pandemic provides a glimpse of the flavour and vibrancy lost in the cities' empty streets, ghostly markets and vacant buildings, which can be re-imagined and re-claimed by its people. If there is a city in a post-pandemic state, what story will it tell? Whose story will it tell? The pandemic presents a time to do away with the city structures that serves a few and presents a time to tell new stories that acknowledge the past towards making an inclusive and just society. The Chatty Bench Project offers one way of creating and telling these often silenced stories using immersive technologies.

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