Translating HCI Research to Broader Audiences: Motivation, Inspiration, and Critical Factors on Alternative Research Outcomes

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Abstract

Alternative Research Outcomes (AROs) go beyond traditional academic publications, taking diverse forms such as documentaries, DIY tutorials, or exhibitions. With growing recognition of the need for more inclusive and contextually appropriate research dissemination, AROs are particularly relevant in HCI and design research. Yet, little has been discussed on why it is important to work on AROs. What are key qualities of AROs? How can the HCI community benefit from learning more about creating AROs? By analyzing six case studies, we propose four qualities of AROs and demonstrate how they emerge in the timeline of a research project. We argue AROs can be adapted to diverse audience needs and share research insights that may extend beyond the original research goals. Our work contributes to a deeper understanding of how AROs can support inclusive research dissemination practices, enabling HCI researchers to engage broader audiences and extend the relevance of their work.

CCS Concepts

• **Human-centered computing** → Human computer interaction (HCI); Interaction design.

Keywords

Research Outcomes, Research Communication, Alternative Forms, Knowledge Production, Audio/Video Documentary, Zine, Art Installation, DIY Tutorial, Digital Media Content

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1 Introduction

Text has been central to academic knowledge production and dissemination, facilitating dialogue and critique within scholarly communities [45, 117]. While textual forms offer structure and the ability to convey complex arguments [58], they often reveal inherent limitations on accessibility and inclusivity due to dense academic language and subscription-based access models. Despite funding agencies encouraging the reframing of scholarly work at a basic reading level without using jargon or field-specific language [31, 155], text frequently fails to capture the multifaceted nature of knowledge, such as experiential, embodied, or context-dependent knowledge [107, 134]. The lack of sensory or cultural nuance in text often alienates non-academic audiences [15, 110, 154], diminishing the lived realities of research participants and the rich materiality of tactile, visual, material, and auditory dimensions in the design processes [22, 82]. These limitations call for a broader spectrum of dissemination methods that can address diverse audience needs and complement the epistemological strengths of textual forms.

Recent efforts in the international academic communities have challenged traditional textual dissemination by embracing diverse knowledge-sharing methods to better translate research outcomes. From New Zealand (e.g. [116, 128]) to Canada (e.g. [84, 85]) to Scandinavia (e.g. [36, 56, 133]), these initiatives foster collaboration between academic institutions, community organizations and industry partners to explore new ways of sharing knowledge for audiences outside academic boundaries. Notably, scholars in Participatory Action Research (PAR) [7], Participatory Design [125], Co-Design [120, 121], Community-Based Participatory Design (CBPD) (e.g., [137]) and Community-Based Participatory Research (CBPR) (e.g., [18]) emphasize close participant engagement to co-create research-based solutions and insights. These approaches also prioritize sharing research findings with broader audiences for them to benefit from research.

Following this initiative, design researchers in the HCI community are exploring creative platforms, such as digital and social media, interactive websites and public exhibitions, to share research findings. This shift towards ***Alternative Research Outcomes* (AROs)** reflects rising interest in more engaging, diverse and inclusive dissemination methods in the field of HCI [130, 147]. AROs include forms such as audio/video documentaries, non-academic writings, multimedia artifacts, public exhibitions, zines, design fiction films and podcasts dedicated to translating and sharing research for their audiences. AROs offer a unique avenue to convey research insights that may extend the original research goals, fostering deeper engagement within and, importantly, beyond the academic community. However, documentation, discussion, and reflection on AROs remain limited to date.

The goal of this paper is to introduce the concept of AROs so that the HCI community can further take up, discuss and refine this initiative. We examine six case studies of AROs: **Audio Documentary** (*Beyond Looking Back* [148, 149]), **DIY Tutorial** (*Table-Non-Table* [62]), **Documentary Shorts** (*Inner Ear* [28, 101]), **Digital Media Content** (*Social Platform for Playful Community* [77, 118]), **Art Installation** (*Meaningful Spaces, Meaningful Places* [19, 20, 114]), and **Zines** (*Midwestern Current*). We selected these cases because they allowed us to gain first-hand insights into the design, creation, and dissemination of AROs. Despite their diverse approaches, each of the cases communicates HCI research outcomes to broader audiences through creative forms that extend beyond traditional written publications. We aim to be generative rather than conclusive in introducing a small yet diverse set of six ARO case studies. Based on our analysis, we define an ARO as **a uniquely situated, dedicated research activity or artifact that emerges as a new endpoint in the research timeline, aiming to translate, communicate, or disseminate research insights in an accessible and engaging form tailored to the intended audience**.

This paper reports how we arrived at this definition by investigating and analyzing six ARO case studies to inquire into the following research questions: What are the key qualities that define an ARO? What is the importance of working on AROs? What is 'success' for an ARO? How could AROs emerge in the research process? The paper makes three contributions. First, we introduce six cases of AROs by unpacking their motivations, presentations, and distribution methods. Second, we articulate four emerging qualities of AROs—*translational*, *situational*, *transparent,* and *initiatory*—by analyzing our first-hand accounts of six ARO case studies. Third, we discuss how AROs could emerge in the research timeline and pose questions on critical inquiries and future engagement of AROs in the HCI community.

2 Background

2.1 Knowledge-Sharing in Academia

Knowledge, at its core, is an epistemic construct that emerges from a social and cognitive process of human observation, experimentation, and collective understanding [64]. Knowledge is generated through both formal and informal processes, ranging from empirical research and theoretical reflection to lived experiences and communal practices [37]. Dissemination, the process of sharing knowledge, has historically been intertwined with textual forms due to their capacity to preserve, standardize, and communicate ideas across time and space. The text serves as a foundational medium, offering structure, permanence, and the ability to convey complex arguments [58]. From the earliest written records to contemporary academic publishing, the text has been central to knowledge production and dissemination, facilitating dialogue and critique within scholarly communities [45, 116]. However, this reliance on text reveals inherent limitations, particularly in its accessibility and inclusivity.

Academic communities value nurturing a welcoming and rewarding culture of sharing knowledge [123], recognizing it as a cornerstone of collaboration, innovation, and scholarly advancement. Traditional academic knowledge-sharing channels—conferences, seminars, workshops, and publications like journals, books, and research papers—facilitate cross-disciplinary dialogue and exploration of complex problems and new frontiers of knowledge. While knowledge sharing among scholars has always been a priority, there is a growing emphasis on extending this practice to the general public, acknowledging that publicly funded research carries a responsibility to not only contribute to societal progress but also disseminate findings to the public, who has a right to access this knowledge (e.g. [108]). However, high subscription fees and for-profit models of academic publishers often force scholars to pay

to make their work publicly accessible [38]. This means the public ends up paying twice for tax-funded, closed-access academic research publications.

Researchers are expanding their reach beyond academia by exploring more accessible forms, including TED talks [83, 144], social media, podcasts [91, 152], YouTube [78, 138, 152], blogs [9, 59], scientific illustrations and animations [17, 53, 69], science slams, and science fairs. These efforts, known as "science communication," aim to make scientific information and scholarly activities accessible to the public [26, 39], enhancing scientific awareness, understanding, and literacy [16]. However, such top-down approaches often overlook cultural, political, and geographical nuances inherent to research and limit engagement with those deeply connected to or affected by research. Recognizing these limitations, public and government funding councils (e.g., European Commission [105], Government of Canada [104], and Federal Ministry of Education and Research in Germany [106]) increasingly require and support open access initiatives [131], making scholarly articles freely available, granting the public the right to read, download, copy, distribute, print, search, or link to the full texts of these articles, theses, books, or other academic materials [135]. Open Access democratizes knowledge [65], promotes broader dissemination, and fosters collaboration and innovation by removing academic barriers, such as institutional paywalls and subscription fees, and granting the public equal access to scholarly information [79, 88].

Echoing the values of accessibility and removing barriers to knowledge, feminist critical theory underscores the need to democratize research and reach broader audiences [109]. Maintaining a critical stance [1], feminist scholars question "who our [scholarly] work is for." Feminist scholars criticize how academic success often perpetuates "overtly discriminatory paywall" and "gatekeeping that excludes community participation" [6:12]. Instead, they emphasize reciprocal and intersectional knowledge-sharing that prioritizes mutual respect and includes the voices and values of those who are historically marginalized or silenced [41, 113, 146]. Advocating for feminist epistemologies, they embrace pluralistic perspectives, recognizing that knowledge is always situated [60] and shaped by social, cultural, and political contexts [61, 72, 124]. The concept of situated knowledge challenges the notion of objective, universal knowledge and its inherent power dynamics [55]. This emphasis on inclusivity and diverse perspectives resonates across disciplines, including psychology (e.g. [92, 136]), education (e.g. [8]), and anthropology (e.g. [73]), all of which are moving toward a more nuanced understanding of individuals and groups, breaking the rigid subject-object relationships. In HCI, the emergence of AROs reflects this shift, offering a pathway to challenge traditional power structures in knowledge production and dissemination through inclusive, reciprocal, and accessible ways of sharing research insights.

2.2 Making Diverse Endpoints of HCI Research

HCI and design researchers employ various methods to share research insights within and beyond academia. They excel in producing creative outputs, drawing on diverse materials for research activities [93, 111, 122], inspired by portfolio culture in design school [21] and the cross-pollination of artistic techniques in design and art [142]. HCI and design communities increasingly embrace alternative ways of presenting research outcomes, such as interactable objects, long-lived artifacts, annotated portfolios, visual-oriented publications, live demos and handcrafted brochures (e.g., [10, 63, 71, 87, 111]). In Research through Design (RtD) [150, 151] and constructive design research [76], the focus has shifted to creating research artifacts and documenting the process as a form of research inquiry (e.g., [12, 13, 98, 99]). This approach prioritizes exploring the influence of research prototypes and artifacts on participants' lived experiences and perceptions [96]. Annotated portfolios visually present the "fruits of design," [46] including insights, contexts and reflections on a research journey [70]. They aim to elucidate how artifacts can generate new knowledge, illuminating the "temporal and relational aspects" of the design space [24, 87].

In response to this trend, the HCI and design research community has pursued new avenues to accommodate diverse research outcomes. The *Pictorial* track, first introduced at the DIS conference[1] in 2014 and adopted by other HCI conferences like TEI[2], encourages visual-oriented publications to convey the visual essence of research [10]. *Demo* tracks at CHI[3] and CSCW[4] showcase the functionalities and capabilities of research prototypes in live settings, exhibiting a wide spectrum of visual, tangible and interactable prototypes. Other tracks, such as *Artworks*[5] at DIS 2023, *Video Showcase*[6] at CHI 2023, *Studio*[7], *Art and Performance*[8] at TEI, and *Critique*[9] at NordiCHI highlight avenues for diverse formats. Pierce emphasizes interactive presentations and curated exhibits are integral to the design research process, benefiting the research community and "possibly to study participants, specific user groups or the public more generally" [25:736].

The growing trend of sharing the details of research process has driven HCI researchers to explore creative ways to involve non-academic audiences. Gaver et al. experimented with high-volume batch production to distribute prototypes to 20-100 participants, gathering a large volume of qualitative data [12, 52]. In another project, they collaborated with a broadcasting team to feature their research on a TV show, reaching over 2 million viewers [48]. Inspired by these efforts to spread research to broader audiences, Pierce batch-produced a counterfunctional camera—a device that must be broken open to access the captured media—and distributed them via free giveaway ads on Craigslist, community bulletin boards, and by quietly leaving the packaged prototypes at local retail shops ("*droplifting*") [112]. Utilizing digital media, Altarriba Bertran et al. documented speculative design ideas in a *catalogue* framed as an annotated portfolio, then shared online for feedback and iteration [2–4]. Bertran also used a public Instagram account as an autoethnography tool to document and share the research process and speculative ideas [143].

[1] https://dis.acm.org/2024/pictorials
[2] https://tei.acm.org/2020/participate/pictorials
[3] https://chi2024.acm.org/for-authors/interactivity
[4] https://cscw.acm.org/2024/index.php/submit-demos
[5] https://dis.acm.org/2023/call-for-artworks
[6] https://chi2024.acm.org/for-authors/video-showcase
[7] https://tei.acm.org/2024/index.php/call-for-studios
[8] https://tei.acm.org/2024/index.php/art-and-performance
[9] https://www.nordichi2024.se/critiques

HCI research is shared not only with the general public but also with specific communities. Winschiers-Theophilus et al. paid attention to how their indigenous research partners in the global south were often systematically excluded from academic platforms like publications and conferences. To address this, they hosted an "*Indigenous Knowledge Fair*" to promote pluralistic and inclusive knowledge dissemination within these communities [145]. *Zine*—a self-published booklet that often covers niche topics [63]— can invite a much larger audience in the community. Fox et al. packaged research findings into zines after conducting a multi-sited ethnography for feminist hackerspaces [40]. Inspired by a local art festival featuring zines rooted in the "dissatisfaction with existing models of knowledge transmission," they collaborated with feminist hackerspace artists to produce handmade zines and present them at a feminist zine festival, which later gained attention on social media [42, 43]. Similarly, the maker culture inspired *DIY tool kits* for research prototypes (e.g., [48, 89]), providing detailed instructions to re-create research prototypes [27, 50].

As HCI and design research continue to evolve, diverse research outcomes contribute to richer, more impactful research. These creative approaches also communicate knowledge on materiality and functionality inherited in specific forms apposite to the intended audience, challenging conventional notions of scholarly communication and knowledge dissemination. We aim to gain deeper insights into the motivations and considerations behind these efforts, their impacts on the research process, and their roles within the HCI community.

3 Motivation & Approach

The authors of this paper are a diverse group of design researchers, ranging from master's students to full-time professors, from a variety of cultural, geographic, and racial perspectives. We share an interest in recognizing the importance of creating alternative outcomes in HCI research, and this shared interest brings us together. In our design practice and through engaging in a series of conversations with HCI researchers at conferences, we have witnessed a growing interest in creative approaches to share research, including audio/video documentaries, non-academic writings, multimedia artifacts, public exhibitions, zines, design fiction films and podcasts. However, there is a lack of documentation and in-depth discussion about the significance of creative endpoints in HCI research and their impact on broader audiences, particularly non-academic audiences. Thus, we aimed to initiate the discussion by gathering diverse AROs, not by their noticeable difference in forms and materiality, but by understanding motivations, situated contexts and first-hand experiences of engaging with audiences in and beyond research timelines, which are often untold in academic publications. It is important to acknowledge that we are not the only researchers who have practiced this approach to research dissemination. There are prior research examples have existed for some time, and new examples continue to emerge (e.g., *HEartS Professional Project*[10], *Tingbao*[11] [115], *Capra Short Film* [97], *Improbotics*[12], and *Permission to Muck About*[13]).

This paper directly builds on the DIS 2023 workshop on alternative research outcomes [146]. The workshop developed the nascent concept of ARO by bringing together HCI and design researchers who are working on exploring and implementing creative and innovative approaches to research dissemination. In addition to collaborating with some workshop attendees who were interested in continuing the discussion (Yoo, Ppali, Odom, Zhuang, Kritika, Olson, Berger, Ringland), we employed a targeted sampling approach [141] to identify and engage designers and researchers with direct experience in creating and sharing AROs (Wieczorek, Biggs, Desjardins, Odom, Wakkary). We contacted these creators of earlier ARO exemplars, inviting them to contribute their expertise. This approach ensured our data and analysis were grounded in first-hand experiences and critical reflections on working with AROs. We selected AROs for case studies based on the following criteria: (i) Do the creators of an ARO desire to be part of this paper? (ii) Are the creators able to provide their first-hand insights and reflections? (iii) Does an ARO have a dedicated goal in delivering specific research insights? (iv) Does an ARO have an intended audience? Through this iterative process, ultimately, three AROs were selected among the 11 projects presented at the DIS 2023 workshop and three AROs from earlier exemplars in the HCI community. Each case represents a distinct context, demonstrating a diverse range of perspectives informed by their creation. Importantly, the six ARO case studies represent only a small set of emerging approaches to creating alternative forms of research outcomes within the HCI community.

Our goal is to present a collective voice across six case studies. All authors of this paper continued our discussions over twelve months, beginning by asking the creators to provide a brief description of their AROs. Then, the first author hosted individual in-depth Zoom interviews with the creators of each ARO to explore questions that extended our selection criteria. These questions encompassed their motivations, the ARO's base research, intended audience, rationale for choosing specific forms, key takeaways, and possible friction and limitations of working with AROs. Based on the information gathered from the creators, including their first-hand experiences and personal narratives shared during interviews, the first author revised and finalized the case study descriptions for each ARO, which are presented in the following section. Further, the authors of this paper engaged in a series of synchronous and asynchronous discussions, including recurring group discussions on Zoom and small group meet-ups for those who are geographically close. Methodologically, we draw on critical self-reflection (e.g., [68]), collective brainstorming (e.g. [14]), and design-led comparisons of research artifacts (e.g. [95]) involving an iterative process of examining case examples to identify and define emerging qualities of ARO. Emerging themes, values, and nuances were iteratively developed and polished from the creators' own experiences and reflections working with AROs, recognizing and respecting the crucial role of their positionality and nuanced insights in each

[10] https://www.arts.ac.uk/knowledge-exchange/stories/hearts-professional-project-vr-technology-performing-arts

[11] https://2024wip.cyens.org.cy/exhibition/symbiocene-anthropocene/tingbao

[12] https://improbotics.org

[13] https://designresearch.works/permission-to-muck-about

case. Throughout this process, we maintained close communication, engaged in multiple rounds of edits and exchanged continuous feedback via written responses over emails, iteratively refining our collective understanding of AROs to ensure a shared voice in the analysis.

4 ARO Case Studies

In this section, we introduce and describe the six cases of AROs drawing from design research in HCI: **Audio Documentary** of *Beyond Looking Back* [148, 149], **DIY Tutorial** of *Table-Non-Table* [62, 100], **Documentary Shorts** of *Inner Ear* [28, 101], **Digital Media Content** of *Social Platform for Playful Community* [77, 117], **Art Installation** of *Meaningful Spaces, Meaningful Places* [19, 20, 114], and **Zines** of *Midwestern Current*.

4.1 Audio Documentary: Translating a Publication into Audio for Blind Participants [Beyond Looking Back]

Beyond Looking Back explores how people with blindness capture, revisit and share their meaningful life moments through home-visit interviews with nine blind participants. Although the study findings were published, COVID restrictions in 2021 limited the hosting of a follow-up session for group debriefing. Yet, participants desired to know how other participants responded to the interview questions—to learn about other blind people's reminiscence experiences. This strongly motivated the research team to make an alternative version of the research findings in a suitable form for the blind participants. Therefore, an hour-long ***Audio Documentary*** *(Yoo, Odom, Berger)*, translating a published paper [149], was created as an ARO.

Early in the process, the research team recognized the importance of contemplating their positionality (prompted in part by the fact that all team members were sighted), being responsible for

Table 1: A summary of six ARO case studies.

Form	Base Research	Intended Audience	Summary of ARO
Audio Documentary	*Beyond Looking Back*: Designing reminiscence experience with people with blindness.	Research participants and their loved ones.	An hour-long audio documentary sharing research findings featuring the participants' own voices to give back the research outcomes to the participants.
DIY Tutorial	*Table-non-table*: Exploring reflections on living with an interactive everyday object over time.	Makers and crafters in local and online communities.	Documenting and sharing step-by-step instructions for creating the research prototype with the local/online maker community.
Documentary Shorts	*Inner Ear*: Physicalizing vibration data captured in homes to understand people's perceptions of personal data.	Research participants and their close network of family and friends.	12 documentary shorts (2-4 minutes each) unpacking participants' experiences of collecting data and living with the Inner Ear device.
Digital Media Content	*Social Platforms for Playful Communities*: Ethnographic research exploring 'play' in an online fandom community.	ARMY community (BTS fandom).	Digital media content (e.g., TikTok, YouTube, podcasts) for sharing research findings and insights with the community.
Art Installation	*Meaningful Spaces, Meaningful Places*: Exploring emotional engagement in people with dementia by art-creation and co-created VR experiences.	Conference attendees and pop-up visitors from the public.	An art exhibition presented at an academic conference, showcasing participants' creative journeys through artworks and challenging societal preconceptions on dementia.
Zines	*Echoes from the Deep:* Speculating on lost and forgotten indigenous shipwrecks in the American Midwest. *Wet Lands*: An autoethnographic bike tour exploring human/non-human entanglements in the river.	Local artists, activists, and residents who visited the zine library.	Sharing visual reflections of a larger design agenda investigating the entanglements of American Midwestern water, infrastructure, and agriculture.

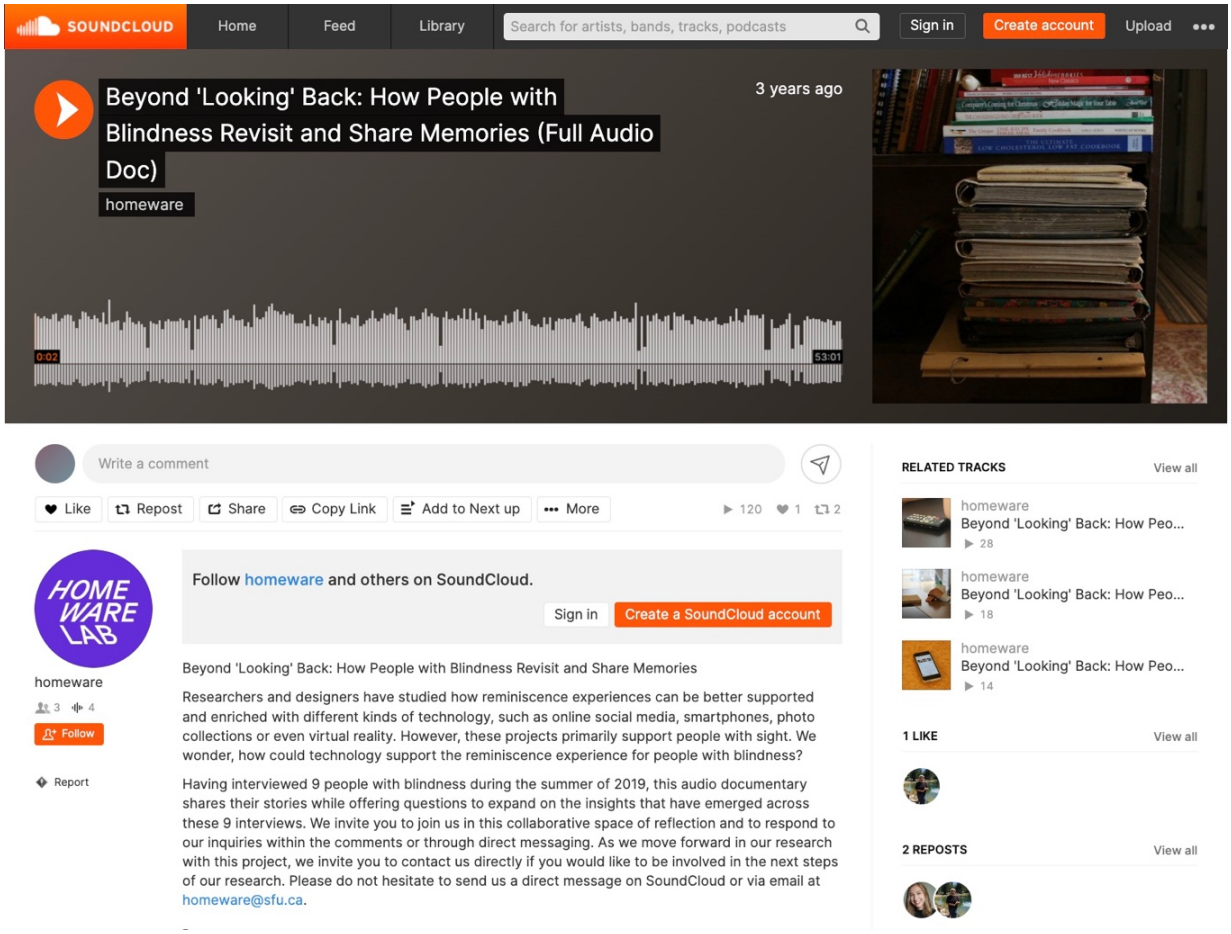

Figure 1: Beyond Looking Back *Audio Documentary* on SoundCloud.

sharing research outcomes to appreciate and commemorate participants' contributions, and foregrounding their voices as the core component in **Audio Documentary**. The research team adopted a critical listening positionality from sound studies [119] in their listening stance (e.g., conducting interviews and listening to participants' lived experiences) to be sensitive in listening and framing the listening body and the stories being told. Further, the unique locational positionality of the research, conducted on the unceded territories and ancestral lands of indigenous peoples in Western Canada, inspired the adoption of a decolonial lens, challenging established colonial thoughts, ideologies, structures, and power dynamics [32]. This lens informed the framing and composition of **Audio Documentary** [147]. The concepts of *storywork* and *storyworlds*, where the stories and sonic worlds bound in participants' voices exist in reciprocal and interrelated ways [5], provided a firm theoretical foundation.

The intended audience for **Audio Documentary** was indeed the participants who directly contributed to the research, but it was later extended to include partners, family members, and others in their social circles. Although not directly involved, they were invited to the research as significant others, spouses or grandchildren, who took part as drivers, daily assistants, or companions. They were often present during the research activities, observing and sometimes joining the conversation—their engagement and feedback further motivated participants, encouraging ongoing discussions to foster deeper involvement in the research. Although the published paper in PDF form met accessibility standards, participants found it challenging to navigate academic jargon using screen readers. Sound was identified as the most preferred form for the participants during the interviews. Grounded in this insight, the team prioritized their preferred sensory modality to create an hour-long audio documentary, narrated in plain language and featuring participant voices from the interviews. This allowed participants to connect with each other's stories. With the participants' consent, the documentary was shared on SoundCloud[14], enabling participants to keep an easily shareable digital copy.

4.2 DIY Tutorial: Long-term Engagement with the Maker Community [Table-Non-Table]

Table-non-table features a slowly moving stack of paper supported by a motorized aluminum chassis [62, 100]. Grounded in ideas

[14]https://soundcloud.com/homewarelab/beyond-looking-back-full-audio-doc

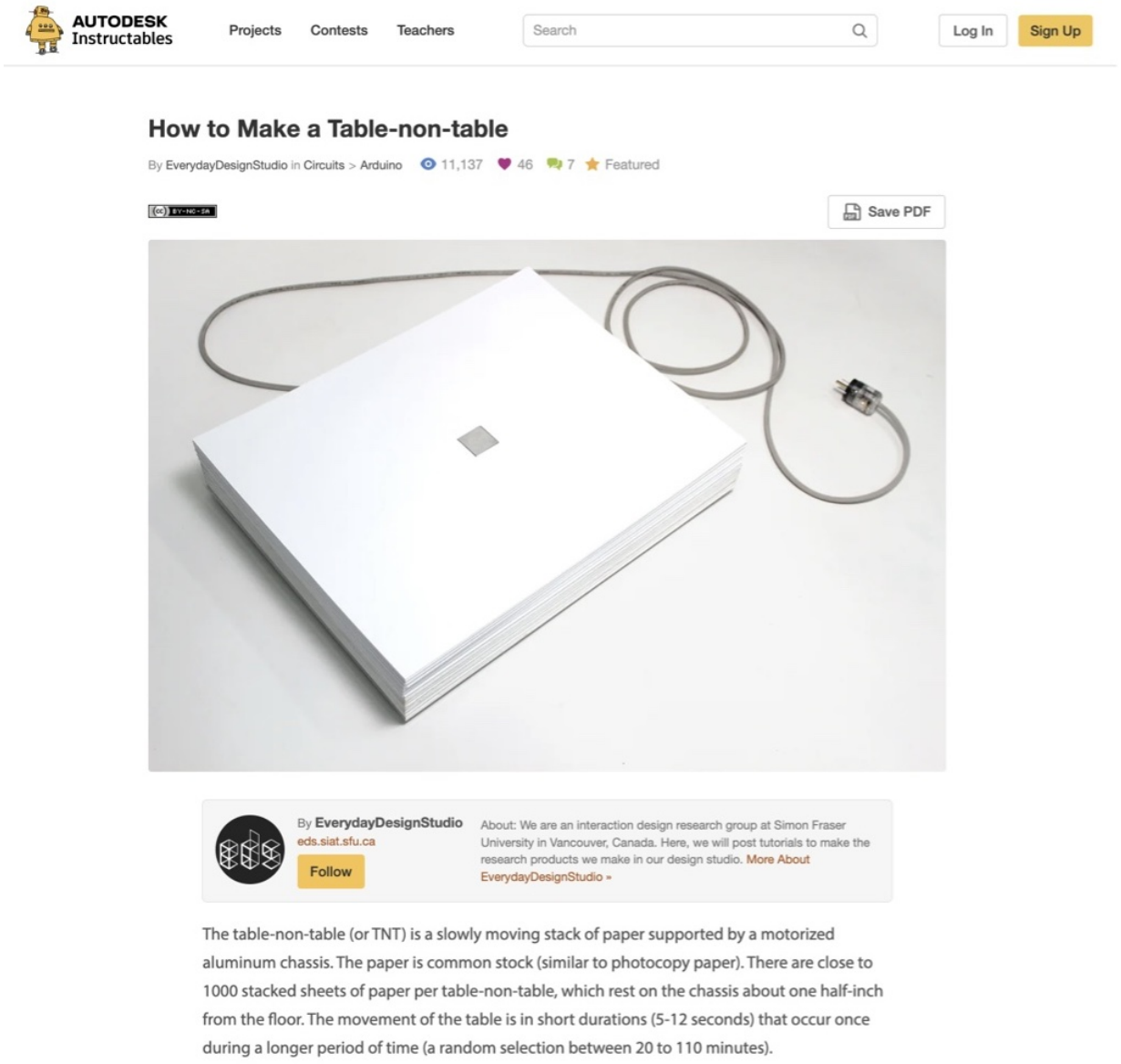

Figure 2: "How to Make a Table-non-table" *DIY Tutorial* on Instructables.

and research informed by the notion of everyday design [140], the project explores a different way of connecting everyday materials combined with computational behaviours, manifesting the idea that "everyone is a designer" [62]. In essence, *Table-non-table* asks, "How can people unintentionally use the object?" [100, 139]. A ***DIY Tutorial*** *(Wakkary, Odom, Desjardins)* was created as an ARO and shared on a popular DIY website—Instructables—as an experimental approach to document and communicate the details of the design process[15].

The team was positioned as researchers but also designers in practice and makers at heart. The team was deeply engaged with local makers and DIY culture for prior projects (e.g., [25, 30]) in Western Canada. **DIY Tutorial** was an opportunity to share the insights gained throughout the research process with the maker community on Instructables. Translating the research into DIY instructions was further motivated by first-hand observations of disparities in maker spaces. Power dynamics often persisted despite many maker spaces claiming to provide an open, inclusive space for people passionate about making. The research team raised the critical question through the tutorial: Who are the makers?

The DIY tutorial served as both a contribution to the community and as a new way to document and archive the design research process as supplementary material to written publications. Research prototypes and artifacts ("*things*" [94]) were often shared on platforms not designed for academic projects (e.g., [112]). The team

[15]https://www.instructables.com/How-to-Make-a-Table-non-table

Figure 3: Behind-the-scenes of *DIY Tutorial.*

recognized Instructables as an ideal platform, providing recipe-like, step-by-step instructions that could organize CAD files and relevant code blocks in one post. This approach was more cost-effective than creating a dedicated project website or personal portfolio and allowed the project to reach a large, established maker community. Each tutorial step reflected the team's learning process in communicating the intricacies of the RtD project to makers.

DIY Tutorial was dedicated to the makers, crafters and their local/online communities, who inspired the research team and offered technical knowledge for creating research prototypes. It contributes to the collective knowledge on Instructables. Even being featured on the main homepage, **DIY Tutorial** momentarily drew significant attention. While the reactions were mixed, it remains a valuable resource for makers to learn specific skills, such as programming electronics or cutting a precise square hole in the center of a paper. To date, **DIY Tutorial** on Instructables has been viewed nearly 11,000 times, liked 45 times, and received 7 comments.

4.3 Documentary Shorts: Leaving Records of Participant Contribution [Inner Ear]

The *Inner Ear* is a porcelain device that records vibration data to explore people's relationship with data in their homes [28]. After a week, the research team collected the device and "physicalized" selected recordings into two 3D-printed ceramic rings attached to the original device. The physicalized form was grounded in participant data, carefully positioned and contextualized within their living environment. Six households in Seattle, USA, participated. The research team filmed three home-visit interviews and produced two short videos per household, creating 12 ***Documentary Shorts*** *(Olson, Desjardins)* as AROs[16], which reflect the trend of consuming short videos [86] that can live outside of an academic library/publication.

[16]https://www.studiotilt.design/inner-ear/visit

Documentary Shorts not only collect data but also capture and share participants' lived experiences with the *Inner Ear*. The shorts were primarily made from b-roll footage of participants' space (where the *Inner Ear* was placed) layered with interview audio. Two shorts were created for each household: one documenting the experience of capturing vibration data and another filming the first reactions to seeing their physicalized data and lived experiences with the *Inner Ear*. Video provided an accessible way to present participant experiences using dynamic visuals, intimate dialogue, and genuine interactions.

Olson's occupational positionality as a documentary filmmaker and the team's geological positionality in the Seattle area greatly shaped their approach. Participants were already aware of extractive data approaches by big tech companies, such as Amazon, Google, and Meta. Therefore, filming during the interview raised ethical concerns about capturing personal details in domestic environments (e.g., [57, 75]). The team prioritized transparency and ongoing consent throughout the filming process and foregrounded the research process by explaining the nature of the collaboration and translating the research details ahead of time [101]. Ethical considerations resurfaced during editing, as the team was acutely aware that their subjective choices, like editing participant dialogue, could impact how participants were presented. The team remained mindful of how participants' words were framed and stayed in contact throughout editing to ensure a mutually beneficial process that valued their voices.

Initially, the videos were intended as supplementary material in research publications to provide details of the *Inner Ear* project for HCI and design research communities. As the project progressed, the question arose: "Who would be more involved and interested in this project?" Thus, the intended audience shifted from academics to participants and people around them. The team aimed to dive deeply into participants' personal experiences and reflections, created **Documentary Shorts** and shared them with participants.

Figure 4: *Documentary Shorts* of six households are featured on Studio Tilt's website.

Figure 5: *Documentary Shorts* are produced with videos and recordings captured during the home visits and interviews.

Figure 6: "Inner Ear Party" hosted by the research team who created *Documentary Shorts*. The party featured a casual Q&A session and showcased participants' Inner Ear devices.

Delivering not only research insights but also participants' narratives allowed **Documentary Shorts** to spread beyond academic circles, such as participants' personal networks. After the study was concluded, participants were invited to a post-project gathering, allowing them to interact with the research team and other participants, asking questions about and beyond the research and sharing their experiences with others. This event further fostered transparency in the project's decision-making process.

4.4 Digital Media Content: Research Outcomes Dedicated to the ARMY Community [Social Platforms for Playful Communities]

Social Platforms for Playful Communities [77] emerged from ongoing engagement with ARMY, the fandom of BTS (Bangtan Boys, a South Korean boy band), whose members are mostly women and culturally, racially and geographically diverse. Despite its playful nature central to the community's growth [117], the ARMY often faces backlash and discrimination on social media, such as shadow-banning[17] and suspending ARMY accounts on X (formerly Twitter). This research project aimed to support discussion about an alternate online community for ARMY to foster safe, meaningful connections both with BTS and within the community. The research team pushed beyond its academic publication [77] and created ***Digital Media Content*** *(Kritika, Ringland)*, including Twitter

[17] The practice of a social media platform restricting a user's account without notifying them.

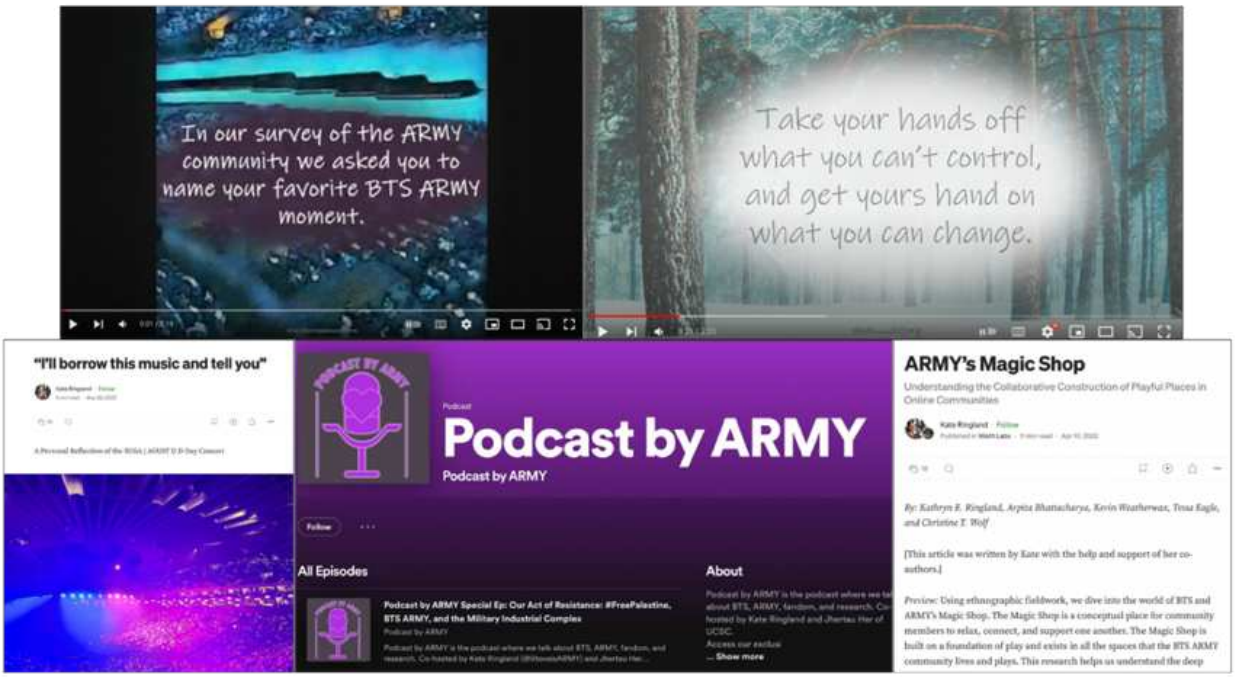

Figure 7: A collection of *Digital Media Content*, ranging from YouTube videos to blog posts and Spotify podcasts.

threads, TikTok and YouTube videos[18] [19], blog posts[20] [21], and a community-oriented podcast[22], as AROs for the community.

The team adopted a value-sensitive approach [44], using surveys with open-ended questions to elicit the core values of the ARMY community—*Respect*, *Love*, and *Community*—and how these values are embodied and expressed in online interactions. With these insights, the team posed provocative questions on how alternative social platforms could be designed to reflect the core values. The composition of the research team, with half the members identifying as both researchers and ARMY members, enabled them to be more sensitive in the research process, conducting the research with care [33, 35, 80] and adhering to best practices for engaging the online community [34]. The team stayed reflexive throughout the research process, being mindful of their 'dual role' as researchers and community members. The manuscript, written in plain language with minimal academic jargon, was shared with the community before submission to the academic venue. Discussions with community members ensured sensitive information, terminology, and events were handled carefully.

Digital Media Content communicated a variety of research findings, not only making the research more accessible and relevant to the ARMY but also amplifying the community's voice while protecting members from potential harm or unwanted attention. These media outlets explain ongoing research activities and published articles, serving as a research communication hub and fostering engagement with the community members. On top of the research insights, **Digital Media Content** describes research practices, such as giving informed consent and protecting private data. This endeavor has characterized researchers as thoughtful and reliable mediators and translators in the community, explaining not just their own work but also other researchers' work done on the community. Community members have responded positively, leading to increased involvement in the research process by suggesting new research ideas and actively participating in interviews and surveys.

A greater understanding of research practices has led to exploring new uses of research outcomes, such as recommendations on community policy. By reporting research findings back to the community in understandable, digestible ways, the community gains insight and opportunities to celebrate their collective achievements. AROs played a critical role in bridging the gap between research findings and the ARMY community, strengthening the researcher-community relationship and fostering continuous engagement and collaboration with the community.

4.5 Art Installation: Art as a Medium for Communicating Participant Contributions and Audiences [Meaningful Spaces, Meaningful Places]

Meaningful Spaces, Meaningful Places is a research project in collaboration with a specialist arts organization, Brightshadow[23], that co-creates Virtual Reality (VR) experiences with people living with dementia [19, 20, 114]. 44 participants with dementia were divided into 4 groups, and they collaborated with artists over 5 weeks of art workshops (20 workshops in total), crafting 4 physical boxes, one box for each group. The box collaboratively represents group members' personally meaningful places, accompanied by soundscapes inspired by the scenes in their memories. These boxes were then transformed into VR environments to offer immersive experiences for participants with dementia, leveraging VR's ability to transport users to new worlds [127] and how this impacted their emotional engagement [126]. Collaborative art-making became a transformative journey, reconnecting participants with memories and allowing them to express their identities. An ***art installation** (Ppali)* featuring the four boxes was presented as AROs at an academic conference (DIS'24). The installation featured a video with soundscapes showing the process of creating the boxes and walkthroughs of the VR environments. Visitors received postcards with photographs and QR codes to experience each box's VR setting through 360-degree YouTube videos.

Art Installation presented the most immediate and intimate way to display the beautiful art of the participants, honoring the authenticity of their work and sharing their creative journey. As host of **Art Installation**, Ppali, representing the research team, acted as both *ambassador,* facilitating the discussion between the participants' artworks and their personal stories, and *activist,* challenging societal preconceptions that focus on the inabilities and limitations of those living with dementia rather than their abilities and to celebrate the creativity of people living with dementia. **Art Installation** endeavored to present the art in a way that honored their participants' perspectives and experiences, consciously reminding the team to be aware of how their interpretation and presentation could influence the audience's perception.

Academics at the conference were the primary audience of **Art Installation**. Instead of engaging with the research through a traditional academic paper, they engaged with the work in an embedded manner, offering them an alternative way to understand the research. **Art Installation** demonstrated the universal resonance of art as a medium for communicating research insights. It created a space where visitors could step into the shoes of the artists—the research participants—experiencing their perspectives not only intellectually but also sensorially and emotionally. This experience provided a deeper understanding of the strength, determination, and creative spirit that fuelled the co-creation process. Presenting collaborative artworks at an open public forum through a tangible format was an impactful way to communicate the creative abilities of the participants and their emotional experiences to the intended audience of the academic community and the wider public. The postcards were used as an artefact that the audience could take home, providing a tangible way to reflect on the experience and share it with others, further extending the reach and impact of **Art Installation**.

[18] https://www.youtube.com/watch?v=nSEfFrJ5LSs
[19] https://www.youtube.com/watch?v=f6_X23U-RI4
[20] https://kateringland.medium.com/ill-borrow-this-music-and-tell-you-7ebfc6ad87d3
[21] https://medium.com/misfitlabs/armys-magic-shop-668cb8a3c0c0
[22] https://podcasters.spotify.com/pod/show/podcastbyarmy
[23] https://brightshadow.org.uk

Figure 8: *Art Installation* was displayed at an academic conference (DIS 2023), inviting attendees and accompanying guests.

Figure 9: Four boxes created by participants are displayed as *Art Installation*, accompanied by QR codes and postcards.

4.6 Zines: Exploring Midwestern Water, Land and Histories through Self-made Magazines [Midwestern Currents]

Zines are self-published, often handmade magazines that artists, designers, and activists have long used to share their work, connect with others and disseminate hyper-local knowledge, often photocopied without professional editing or wide distribution [23, 74]. *Echoes from the Deep: Legends of the Great Lakes*[24] and *Wetlands* are created as AROs in ***Zines*** *(Wieczorek, Biggs)* that provide a visual and impressionistic reflection on a larger design research agenda exploring the entanglements of American Midwestern water, infrastructure, and environmental sustainability through design and computational thinking. Together, **Zines** aim to share a glimpse of the project with a largely academic audience in a visually impressionistic, non-linear, and non-argumentative way.

Echoes from the Deep emerged from research on conservation challenges in the Great Lakes Region. Inspired by how shipwrecks hint at a unique view of maritime history and culture, *Echoes from the Deep* focuses on lost and forgotten indigenous shipwrecks not shown in the Michigan Department of Natural Resources' shipwreck database [90], featuring AI-generated images of indigenous ships that could have existed in the region. *Wetlands* describes an autoethnographic bike tour down a large river, exploring human/non-human relationships and sharing impressionistic and visual reflections. It presents photos depicting cultural and environmental intersections of more-than-human entanglements, such as a gas station BBQ, a bathtub filled with brown water from aquifers in cypress preserves and the river scene with the bike.

The research team has a mixed positionality of being in the lands of the American Midwest and being a designer-researcher. Since 2020, Wieczorek, who is a Midwest native, has moved further *away* from the Great Lakes Region. Meanwhile, Biggs moved *to* the Midwest from the West Coast, where mountains and oceans are largely different from the flat and seemingly water-less Midwest. **Zines** were rooted in a desire to reconnect with the region from afar and discover its abundant waterways and historic wetlands. **Zines** inspired their new perspective, allowing the team to process and express their experiences with the Midwestern landscapes both visually and materially.

As a designer-researcher, craft dissemination—including zine-making—is standard practice for graphic designers, often called a "leave-behind." **Zines** allowed the team to reflect and share their research differently by exploring creative, visual, and material aspects, focusing on care-filled details, textures, and bindings from their designerly perspective. When Biggs discovered the zine library organized by a local arts non-profit in collaboration with a feminist bookstore inviting local artists and residents, they saw it as an open-ended space to share the intricacies of research, wanting to be part of a community space dedicated to zine-making of all kinds. *Wetlands* was submitted and displayed, and visitors and local artists connected with Biggs on Instagram after the pop-up. Seeing the potential of zine libraries for community-building and sharing research creatively sparked the inspiration to host one in the academic context as a conference venue at DIS 2024[25], combining traditional academic practices with more informal and experimental approaches.

5 Case Study Analysis

This section presents four qualities of AROs and identifies their benefits based on our analysis of the six case studies described above.

[24]https://www.cathwieczorek.com/shipwrecks

[25]https://dis.acm.org/2024/zine-archive
[26]https://www.instagram.com/p/C95tS59I-wu

Figure 10: A front page and inside of "Echoes from the Deep".

Figure 11: A front page and inside of "*Wetlands*".

Figure 12: Social media flier for Bakie Book Fair, where the first zine library took place (left), and Instagram post[26] after the second Zine Library hosted at DIS 2024 (right).

Building on these qualities, we have articulated a definition of ARO. We preface the definition of ARO to make the analysis easier to follow. We define an ARO as **a uniquely situated, dedicated research activity or artifact that emerges as a new endpoint in the research timeline, aiming to translate, communicate, or disseminate research insights in an accessible and engaging form tailored to the intended audience**.

5.1 Emerging Qualities of ARO

Through our critical reflection and analysis of first-hand narratives from six case studies, we have identified four key qualities—***translational***, ***situational***, ***transparent,*** and ***initiatory*** —that distinguish AROs from other research activities or artifacts. Importantly, these four qualities are not *a priori.* They were developed from our continuous discussions and retrospective analysis of six case studies. The four qualities are not mutually exclusive. Each quality often works organically with one another to describe

the complex interplay of AROs. Our goal in identifying them is to aid in understanding the boundaries of conceptualizing, designing and making AROs. The four qualities are not conclusive. Although the case studies placed varying degrees of emphasis on specific qualities, all six cases demonstrated the four qualities. We highlight dominant examples in our analysis to illustrate each quality.

5.1.1 Translational. An ARO's ability to bridge the gap between academic research and the intended audience's understanding characterizes its ***translational quality***. Determining a form of an ARO that best delivers the research insights was an essential step to reach audiences at different points in the research process. In our case studies, the intended audience varied from research participants to broader online and offline communities. Our cases revealed that AROs went beyond simply 'translating' research insights into plain language. Instead, creating AROs involved an iterative multi-step process, often making use of various forms of media, such as audio, video, images, DIY instructions and custom print templates.

For example, the forms of **Audio Documentary** and **Documentary Shorts** were heavily inspired by the research participants. **Audio Documentary**'s form allowed the participants to present the quotes in their own voices and created moments of reflection with questions and pauses for the listeners. To achieve *translational quality*, themes in the findings were simplified and rearranged, then translated into plain language. The participants' voices captured in the interview recordings were featured to introduce key quotes, supporting intimacy and authenticity. This effort helped participants overcome the barriers of academic jargon with screen readers, understand the research outcomes, and connect with each other through their voices and stories. Similarly, Olson and Desjardins of **Documentary Shorts** concluded that the short videos would best describe the participants and their social circles' desire to know the details of their lived experiences. They focused on participants' personal narratives and reflections to create short videos that could live outside of academic boundaries and are easily sharable. **Documentary Shorts** effectively made the intricacies of the project visible and showed people's lived experiences in a more digestible and relatable form for participants.

On the other hand, **DIY Tutorial** and **Digital Media Content** were influenced by the communities in which the research teams were involved. **DIY Tutorial** focuses on more practical knowledge sharing to contribute to the local and online maker community. Creating meticulous step-by-step instructions with the goal of providing useful insights for the maker community required thoroughly documenting, annotating, and taking pictures of the entire making process. The **Digital Media Content** case also highlights the importance of utilizing formats and platforms familiar to the intended audience. Choosing various forms of digital media that were already popular in the community ensured the research insights were accessible and relevant to the ARMY community, amplifying their voices in ways they were accustomed to.

Tailoring AROs to their respective audiences with appropriate language and form requires substantially more effort than simply translating the research insights. While AROs are encouraged to take on various forms, we observed a risk of *oversimplification*. For example, in the **Audio Documentary** case, the constraints of the audio forced the simplification of themes, leading to the loss of some nuances in the participant quotes. **DIY Tutorial** received mixed reactions in the online DIY community due to the lack of applicability in the knowledge of solving a 'practical' problem beyond a research prototype. Therefore, ARO creators must be aware of the constraints induced by specific forms of AROs and not make assumptions about audience comprehension.

5.1.2 Situational. We found that AROs are carefully crafted, standalone research contributions designed to resonate within a particular setting. ARO's ***situational quality*** emphasizes its unique and original nature, reflecting on its role in relation to the creator's positionality. In our case studies, we observed that acknowledging and critically reflecting on positionality often came before creating AROs.

Focusing on the creators' positionality influenced the theoretical foundation of **Audio Documentary** and **Zines**. Yoo, Odom and Berger of **Audio Documentary**, working on the unceded territories of the native peoples in Western Canada, adopted a decolonial lens that influenced their approach to framing and designing the ARO. Similarly, in the case of **Zines**, Wieczorek and Biggs' connection to the American Midwest and their experiences as designer-researchers shaped the content they chose to highlight in the form of a zine.

In contrast, the fact that the research teams of **DIY Tutorial** and **Digital Media Content** were part of the intended audience formed a unique intertwined positionality. They both underscore the importance of considering the cultural context of a specific community. Being part of the community gives the advantage of knowing the values and practices of the community, such as being familiar with the maker culture and the underlying power dynamics for the **DIY Tutorial** case or knowing how to approach sensitive topics such as online discrimination and respecting the core values of *respect*, *love* and *community* for the **Digital Media Content** case.

Notably, the **Art Installation** case demonstrated how creators can proactively define their own positionality to challenge societal biases and advocate for social change. Motivated to counter negative stereotypes surrounding dementia, they designed an art installation that celebrated the creativity and abilities of the participants. This choice of a particular form situated their ARO in a way that showcased the participants' work in an impactful way and prompted the visitors, who were mostly HCI researchers, to move beyond deficit-based approaches to designing technology for people with dementia, considering their unique skills and personalities.

These nuanced approaches—considering the creator's positionality, the intended audience's context, and the implications of the chosen form while potentially sharing the situational quality with the audience—make AROs more approachable and acceptable. However, an ARO's strong connection to a particular context can also present limitations on *limited transferability* to other contexts. Removing an ARO from its intended setting risks misinterpretation or misunderstanding of its represented values, as the situational nuances that give it strength may become points of confusion. This risk is particularly evident when the creators' positionality is closely tied to the audience, as in **Digital Media Content**, what resonates with one audience or community might not be as impactful or relevant to another.

5.1.3 Transparent. ***Transparent quality*** captures an ARO's openness and honesty, not only revealing the creator's perspectives and any limitations or assumptions in the research process that may have shaped the ARO but also encouraging critical reflection for both the creators and the audience. This reflection leads to a deeper understanding of the research and its implications. However, we acknowledge that transparency is an ambitious goal that is rarely met. In our case studies, we observed varying degrees of achieving transparent quality: *passive, active* and *mixed* approaches to transparency.

AROs with a *passive approach* provide access to information about the research process and the creator's perspectives embedded in the AROs without actively asking for the audience to provide inputs or engage in direct communication in the creation process of AROs. Yoo, Odom and Berger of **Audio Documentary** shared a full paper with the participants, informing the research results in advance. Yet, they drove the decision on which themes and quotes to include in the documentary. Similarly, **DIY Tutorial**'s transparent view of the design and construction of the research artifact was initiated and driven by the creators, allowing others to understand the decisions made and potentially replicate the project, promoting openness and sharing knowledge throughout the research process.

AROs with an *active approach* prioritize dialogue, where the creators actively seek reflection, address concerns, and encourage conversations with the audience. Olson and Desjardins of **Documentary Shorts** foregrounded continuous communication and ongoing consent with participants, ensuring they understood the research process, addressing ethical concerns about privacy, and obtaining consent at each stage during filming and editing. This proactive approach to transparency helped build trust between the research team (including the creators) and the participants, resulting in well-accepted AROs. Similarly, Kritika and Ringland of **Digital Media Content** demonstrated an active approach to transparency by openly disclosing the research process with the ARMY community, such as sharing their manuscripts before submitting them to an academic venue or celebrating academic achievements. This allowed community members to exchange feedback and ensure that research accurately reflected their values and perspectives.

Lastly, we observed a *mixed approach* to transparency in the **Art Installation** case. Ppali was present at the installation, acting as an ambassador for the participants' artwork, openly explaining the research process, answering questions, and providing nuanced contexts to visitors. At the same time, when Ppali was absent, supplementary materials, such as QR codes to 360 YouTube videos, photographs and take-home postcards, served a passive role in providing more details about the background and context of the research. This mixed approach offers an additional layer of transparency for those who are interested in exploring the research further.

We observed ARO's transparent quality is closely tied to its level of openness and engagement with the audience. Transparency is not simply about revealing every detail but rather about providing meaningful insights into the decisions, challenges, and reflections that shaped the AROs. Approaches to achieving transparency should be carefully planned to avoid *overwhelming the audience* with excessive communication or overly detailed information on research. Finding the right balance and appropriate approaches is essential to deliver the intricacies of the research without sacrificing clarity.

5.1.4 Initiatory. ARO's ***initiatory quality*** refers to its ability to advocate for ongoing interaction and dialogue with and beyond the intended audience. AROs strive to be more than just static research endpoints; they encourage the audience to share their thoughts and impressions directly with the creators or with the people around them. This could include not only research insights but also untold details in the research process and the creation of AROs that are often not shared in academic publications.

In our case studies, we observed that AROs foster multidirectional communication, unlike how traditional research outputs result in one-way dissemination. This is achieved in two ways: by having an easily shareable form or by facilitating a space for open-ended communication between and among the creators and the audience.

Audio Documentary, **Documentary Shorts**, and **Digital Media Content** were designed to encourage conversation through sharing the AROs. The **Audio Documentary** and **Documentary Shorts**, intended for the research participants, later became a catalyst for conversations between them and those around them, including their loved ones. Sharing the AROs within their social circles sparked discussions and reflections, extending the research's impact beyond the intended audience. Similarly, **Digital Media Content** promotes active participation by utilizing widely accepted forms within the community, such as Twitter, TikTok, and YouTube. This approach encouraged community members to provide feedback, share their thoughts, suggest research ideas, and participate in future interviews and surveys, highlighting the reciprocal and initiative nature of AROs.

Meanwhile, **Art Installation** and **Zines** invited more direct in-person conversations between the creators and the audience. **Art Installation** showcased the potential of AROs to create a space for dialogue and reflection. Ppali actively engaged with attendees and visitors, sharing the participants' stories and creative processes. Similarly, the open-ended and non-linear nature of **Zines** allowed audiences to interpret the research from their own perspective. Wieczorek and Biggs' participation at the zine library facilitated face-to-face interaction with visitors, sparking conversations and connections.

From these examples, we observed that AROs foster an open, dedicated space for discussing sensitive topics and issues beyond research insights. They invite the audience to connect with the research, actively participate, and share their perspectives. Yet, open dialogue through AROs can lead to diverse perspectives. Creators should play a role in ensuring respectful communication and preventing misunderstandings of AROs. Another challenge in long-term research engagements is maintaining the momentum that AROs initiate, especially when they rely on ongoing interaction and dialogue with the audience. Other situations, such as limited funding or the conclusion of the study, can pose sustainability issues. Over time, we also explore the question: "What might be a responsible approach to concluding or maintaining the relationship with the audience?"

5.2 What Are We Alternating? – The Benefits of AROs

While creating AROs demands extra time and resources, working with them has been rewarding and worth the investment. In this section, we present the benefits of AROs that may be **unaligned** with those pursued by traditional knowledge-creation practices.

5.2.1 Fluidity in Research through Open-Ended Exploration. The open-endedness of ARO promotes ***fluidity*** of research outcomes. Written publications focus on academic objectives, and structured arguments often leave little room for expressing the researcher's personal reflections and emotions in their research journey. In HCI, subtle nuances in design are often captured and acknowledged as tacit knowledge [67]. Yet, sharing or documenting tacit knowledge is challenging due to its unspoken and intuitive nature, which is deeply embedded in personal experiences and specific contexts (e.g., [11, 129]). We see AROs as one way to articulate tacit knowledge. We observed AROs possess an inherent capacity for self-expression for researchers, offering individual and collective experiences by easing anxieties of engaging with perfectly polished research outcomes for broader, non-academic audiences. Biggs of **Zines** transformed personal research experience—an autoethnographic bike trip—into a narrative of their lived experience that was open to interpretation by the audience. Once positioned effectively, AROs require minimal explicit guidance, offering unique experiences for the audience through different materialities. The use of sound in **Audio Documentary** and **Art Installation** or raw materials in **Zines** demonstrates how AROs can convey impressions that traditional academic papers cannot. This flexibility makes research and researchers more approachable, fostering a rich understanding of academic knowledge that speaks to broader audiences.

ARO's creative, expressive approaches and unconventional methods of sharing knowledge push the boundaries of research communication. AROs are not bound to the editorial or structural conventions of traditional academic publications, offering creators great freedom to explore experimental qualities appropriate for their purpose, such as the disorderliness of raw hand-printed zines or the intricate materiality of sound, clay or smell, that advocate for richer, nuanced explorations of research topics that go beyond the limitations of text, imagery, and annotations [46]. Further, ARO's flexible nature embraces unfinishedness, messiness and imperfection, unlike pursuing the highly-finished and robustness of written publication. We observed that the *unpolishedness* can be positively accepted by the audience in the cases of **Zines** and **Art Installation** when presented appropriately. Wieczorek and Biggs of **Zines** noted, *"We wanted to just make stuff that our regular scholarly work doesn't necessarily make time for. Zines allowed us to play with materials, not worrying about details, such as perfecting images, layout, etc., but being explicit about the core aspects of research. Sharing research in academic contexts usually leads to conversations about how to connect with water and non-human agents through research practice. On the other hand, sharing research through zines led to entirely different conversations: how AI-generated images rendered missing data about indigenous ships, telling stories of their loss and how technology interpreted the lived experiences of indigenous people in the region."* Moving away from the rigid formats also invites the audience to engage with research in open-ended ways, initiating unique dialogues based on the medium and context of the presentation.

5.2.2 Community-Focused Values and Community-Driven Objectives. AROs can enhance the collaborative process by amplifying the voices of participants and involved communities to challenge the hierarchical nature of traditional research dissemination. We recognize a key benefit of AROs is their role at the intersection of researchers, academic knowledge, and audiences. For **Audio Documentary**, the team carefully reviewed research findings and interview recordings to gather insights. For instance, they learned that participants with blindness typically speed up audio to access information quickly. While participants expressed a desire to learn about other blind individual's experiences and responses to interview questions, the creators aimed to evoke emotions rather than simply making it purely informative. Therefore, **Audio Documentary** was designed to offer space for personal reflection and deeper contemplation by incorporating relaxing background music, situating the research team as a storyteller, pacing the narrative and inserting reflective pauses.

A commitment to community-focused values, rooted in the base research, guides the development of AROs that cater to the specific needs and preferences of the intended audience by attending to the unique metaphors, jargon, and behaviours of the community. This approach encourages the audience to share AROs with others in the community, extending the impact beyond the initial reach. Kritika and Ringland of **Digital Media Content** noted, *"Too often, academic and professional research benefits the institutions or individuals conducting it while offering little in return to the communities that provide the knowledge, experiences, or contexts being studied. We feel that conducting work without giving back to our communities in some way is extractive. By developing AROs, we aim to create and pave the way for research outcomes that are accessible, valuable, and directly beneficial to the communities involved."*

AROs dedicated to a specific community require careful decision-making. Olson of **Documentary Shorts** commented on ethical concerns regarding the extractive nature of research practices, rooted in the creators' positionality and certain forms of AROs. *"What is being presented in the film could easily be influenced by the team who produce it or, more specifically, the team member in charge of editing, which affects how the story is presented and interpreted. Instead, we embraced this as an opportunity to shape our positionality and perspective. Our voices captured in the interview recordings allowed us to tell our own stories in the film while visually depicting participants' lived experiences. Notably, the transparency in the research process—showing the presence of the camera and research team, including the interview questions we asked—was appreciated by participants, contrasting this approach positively with how larger tech companies typically collect data, such as using End-User License Agreement forms to extract data for marketing."* When recording research activities, the recorder or camera usually focuses on participants. However, similar to how **Documentary Shorts** and **Audio Documentary** show interactions with the creators, capturing the whole scene makes research more equitable by presenting research in a way that brings researchers and participants to the same eye level.

5.2.3 Extending Responsibility for People Involved in Research. AROs foster ethical considerations by ensuring reciprocal and meaningful research processes and outcomes for audiences. This contrasts with traditional publications, which often prioritize academic recognition over community engagement. Many HCI research projects involve collaboration with non-academic people who influence the research process. As HCI research inherently involves people ("Human"-Computer Interaction), we, as the creators of AROs, share a strong sense of ***responsibility*** to the individuals and groups who contributed to our research.

Yoo of **Audio Documentary** said: *"Producing the audio documentary required us to sift through hours of interview recordings to find quotes that appear on the published paper. When we edit those quotes for written publication, we work with the transcribed versions in text. Despite we, as researchers, work our best to preserve the meaning of the quotes, we make quite a few changes to their words—cutting and stitching bits and pieces here and there. Listening to the quotes in their voices came to a whole different level. I felt a sincere appreciation for the research participants."* PPali of **Art Installation** shared a similar reflection on making deep connections with participants. *"Although I previously worked with people with dementia, my interactions were always brief, testing technology or running short workshops. In the Meaningful Places project, we spent six weeks with the same participants, creating art and hearing their stories. Over time, we became friends who shared the joy and challenges of creating something meaningful together. This experience reminded me why I became a researcher: making humane connections with people rather than focusing on intervention effectiveness or novelty. The **Art Installation** gave me the opportunity to focus on amplifying the voices of those I worked with, rather than my own, and to show the impact of their creativity through our collaboration."*

Witnessing collaborative efforts to make meaningful connections with audiences through AROs has been rewarding. AROs can be a form of appreciation for our contributors. This approach advocates continuous engagement, inviting reflection on individual roles in the research process and dispelling the power dynamics of researchers as "all-knowing" authorities. Prioritizing authenticity and commitment, AROs enable us to explore alternative modes of expression that resonate with both the creators ourselves and the intended audiences.

By exploring these four qualities, we demonstrated how AROs pose questions to reconsider how research is shared, understood, and applied across different contexts, emphasizing fluidity, community-driven values, and a sense of responsibility. Next, we explore how AROs emerged in the research timeline and share unanswered questions that we would like to share with the HCI community.

6 Discussion

We have presented six cases of AROs and identified their four qualities and benefits. From our observation, it was evident that AROs often appeared as an organic progression of research, adapting to the needs of both the researchers and the intended audiences. In this section, we discuss how AROs typically emerge during the research process and highlight some considerations for the HCI community regarding the creation and dissemination of AROs.

6.1 How AROs Emerge in the Research Process

In HCI design research, valuable insights often surface from the accumulation of varying details in the design process. These subtle nuances, rooted in the materiality and intricacies of design, are often learned through the act of "doing" [49] or acquired as tacit knowledge [67]. While AROs showcase the tangible results of this "doing" process, we find it essential to recognize the distinction between the immediate products of research, or research *outputs*, and the lasting knowledge and influence they generate, which constitute research *outcomes*.

6.1.1 Disentangling Research Outputs & Research Outcomes. In the research timeline, base research precedes the creation of AROs, providing foundational insights and knowledge that shape AROs. Reflecting on the creation of AROs in our case studies, distinguishing between research ***outputs*** and ***outcomes*** is crucial. Research *outputs*, such as photos, interview transcripts, or participants' artwork, are immediate products of research activities. However, these outputs become meaningful through careful curation and interpretation. Research *outcomes* encompass not only tangible outputs but also new research directions, shifts in understanding, and impacts on participants and stakeholders [49]. In our case studies, AROs emphasize *research outcomes* by redefining the value of dissemination, moving beyond singular, polished results towards a fluid, iterative and generative nature of inquiry.

Building on the distinction between *outputs* and *outcomes*, our case studies show that the timing of initiating AROs is rarely predetermined. Instead, it often responds to the evolving needs of the research, researchers, and participants. Thus, AROs become tangible manifestations of thought processes at various stages of research, unlike traditional research outcomes that signify a project's endpoint. This raises the question: *At what points in the research do we step away from traditional academic outcomes and embrace alternative forms of dissemination instead?*

6.1.2 AROs and the Research Timeline. Our six case studies revealed key moments when AROs emerged organically throughout the research process, conveying nuanced knowledge or reaching diverse audiences more effectively through accessible forms**.** For example, the research team of **Audio Documentary** initially published their research findings in an academic paper. However, when participants expressed a desire to connect deeper with each other through research, this moment marked a branching point, seeking an alternative approach and realizing that the academic paper was not the most appropriate way to share their findings.

This highlights the need for adaptable research outcomes to specific communities or audiences, echoing broader discussions in HCI around *situated knowledge and inclusive design* [132]. Written publications often fail to accommodate diverse ways of knowing. AROs foster deeper engagement through formats tailored to specific cultural, sensory, or community needs. Their flexibility aligns with the *non-linear and iterative nature* of HCI research, which is rich in materiality and tangible engagement, where insights from one project can inspire new directions or applications of others in the field [76, 150]. This is particularly important in HCI, where the interplay between humans, technologies, and contexts constantly evolves [6, 49].

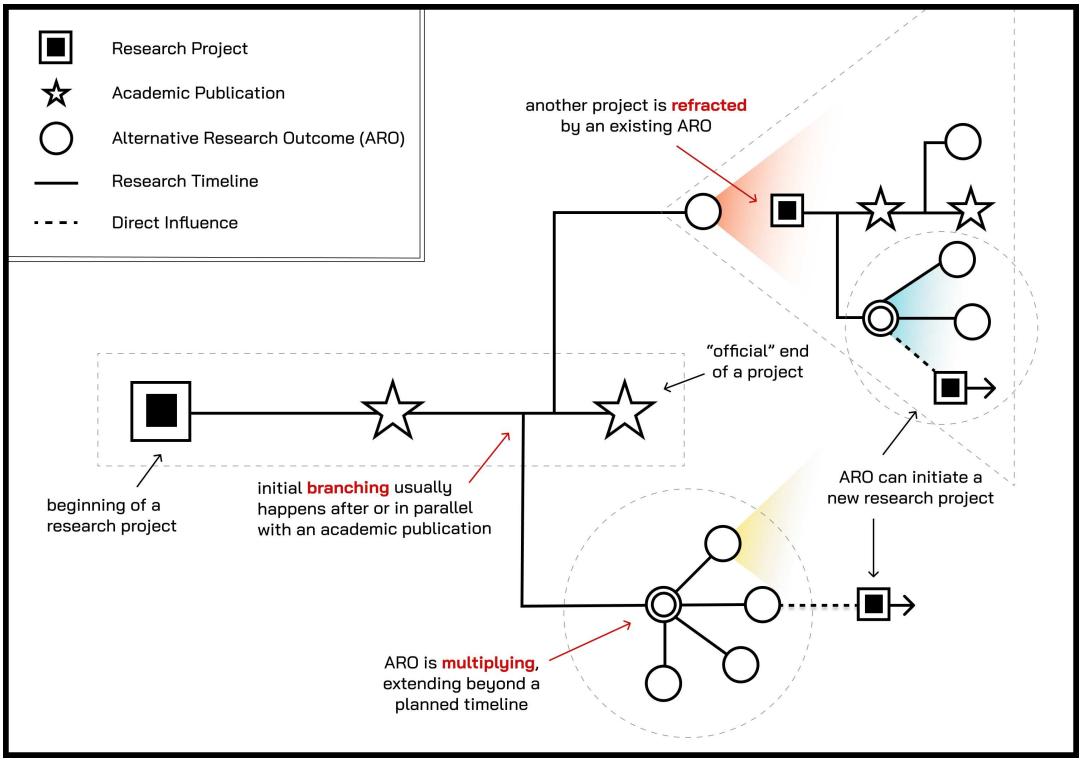

Figure 13: A visual description of the three temporal concepts of ARO.

Analyzing the case studies, we describe how adopting AROs can result in discovering new opportunities in the research timeline, allowing research outcomes to remain adaptable. To conceptualize these moments, we introduce three temporal concepts, building on the temporal vocabulary of design events [103]:

- ***Branching*** occurs when a research project takes an unexpected turn, opening new pathways beyond its initial scope, similar to "tangents" or "perpendiculars" in design research [29]. Branching is exemplified by **Audio Documentary**, **Documentary Shorts** and **Art Installation**, when creators met a breaking point where their goals of creating AROs diverged significantly from the base research. Branched projects may have different objectives from the original research, involving a new medium specifically designed for a distinct purpose, audience, or form.
- ***Refraction*** reflects the influence of one project's insights on another, leading to new directions. In HCI, this mirrors how research artifacts shape and redirect future research trajectories. Our observation of how the local zine library influenced **Zines** and subsequently catalyzed zine-making and sharing in academia exemplifies *Refraction*. For example, creating AROs in the form of RtD videos, documentaries, or zines for one project, capturing the design process and research outcomes, may inspire similar practices in subsequent projects. Refraction demonstrates how creative outputs can ripple through different initiatives, shaping future methodologies.
- ***Multiplying*** occurs when an ARO continues to generate value over time, possibly adapting to entirely new contexts. We observed **Digital Media Content** and **DIY Tutorial** generating audience reactions and further ideas beyond their immediate outcomes. Multiplication of outcomes shows how AROs can outlive the research project and continue to resonate with diverse audiences, expanding their reach and influence. Flourishing beyond how the research project or produced prototypes are initially designed, they can take on a life of their own as different audiences adapt them for their own purposes, such as giving something back or leaving something behind (e.g., [51]).

These concepts are not mutually exclusive; even in our cases, AROs can possess multiple concepts depending on the context. These temporal concepts promote the non-linearity of ARO, not only opening new pathways for disseminating research insights but also materializing outcomes that unfold from the "through" part of design research, reflecting the messy nature of design research journeys, not always following a straight path from start to finish [29, 47, 66, 102]. Finally, AROs raise questions about what it means to conclude a research project, acting as ***new beginnings***, inviting continued exploration, adaptation, and reflection, and transforming research into an ongoing dialogue.

6.2 Open Questions for the HCI Community

We have explored AROs in HCI, highlighting their potential and challenges. Our case studies demonstrate how flexible forms of

AROs push the boundaries of traditional academic dissemination and invite us to rethink how research can be shared, understood, and applied across contexts. However, ARO is still an emerging concept, and the case studies we present are a small subset of what is possible. We believe AROs play a critical role in extending the accessibility and impact of research beyond academia. Moving forward, it is essential to acknowledge the limitations and complexities that AROs may introduce. Next, we invite fellow researchers to reflect on the questions and concerns raised by our discussions.

6.2.1 Are AROs ethical?. The ethical complexities of AROs are heightened by their sustained interactions with participants and communities, compared to traditional academic research. AROs, such as **Audio Documentary**, **Documentary Shorts**, and **Digital Media Content,** often involve personal narratives or sensitive data, raising concerns about privacy, consent, and long-term participant engagement. The open-access nature of AROs can complicate ethical standards used in academic publishing. *How can researchers ensure ongoing informed consent once ARO artifacts are publicly shared? What happens if participants later wish to withdraw or modify their contributions?* Ensuring informed consent is vital, especially when participants may not fully grasp the long-term implications of sharing their personal information in alternative formats. One way forward is to adopt a participatory ethics model that treats consent as an ongoing process rather than a one-time agreement. For example, exploring flexible platforms for disseminating AROs that allow participants to modify or remove content post-publication can offer an additional layer of protection for their rights.

6.2.2 Who are the authors of AROs?. Traditional academic authorship is based on intellectual contributions, while in many AROs, contributors do not always fit this pattern. As demonstrated in the case studies, AROs often involve collaborative efforts from diverse contributors—researchers, designers, community members, and participants—each playing a role in shaping the final outcome. For instance, in **Audio Documentary** and **Art Installation**, participants make significant contributions by sharing personal stories and creative work central to the final outcomes. In our other ARO cases, we found it challenging and limiting to appropriately credit those outside academia who deserve more than being mentioned in the acknowledgments, such as collaborating professionals and artists, into a scholarly portal like PCS. This raises questions of credit and ownership: *Who should be credited, and how should ownership be attributed? How can ownership conflicts be resolved to maintain the integrity of collaboration?* One direction is to develop a more transparent and flexible authorship model, such as an authorship taxonomy that explicitly defines different types of contributions, from intellectual and creative input to technical assistance or community facilitation, similar to open-source software project contribution lists (e.g., Python's contributor list[27], Open AI ChatGPT-4 Technical Report [54]). Foregrounding the formalization of authorship agreements early in the research process can help avoid conflicts by establishing clear expectations, ensuring fairness and promoting trust to maintain the integrity of the collaboration while recognizing the diversity of roles inherent in AROs.

[27]https://github.com/python/cpython/graphs/contributors

6.2.3 What does success mean for AROs?. Analyzing our six case studies, it is clear there is no one-size-fits-all definition of success for AROs. AROs do not rely on traditional academic metrics, such as citation counts and journal impact factors, which often fail to capture the full value, particularly for AROs that prioritize fluidity and social engagement over scholarly prestige. An ARO's success is not about presenting polished, well-cited contributions but rather sharing something, perhaps ambiguous, that evokes a response from the audience. Alternative measures could include impact on the intended audience, ability to foster ongoing engagement and dialogue, and potential for influencing other research projects in the field.

For AROs prioritizing *participant engagement*, such as **Audio Documentary**, **Documentary Shorts,** and **Digital Media Content**, we considered their AROs successful when positively accepted by participants, such as receiving a support message or seeing participants share the AROs with others in their network. AROs like **DIY Tutorial** and **Art Installation** were deemed successful when they opened a space for continuous engagement and discussion, such as getting more than 10,000 views on Instructables for **DIY Tutorial** or having visitors take postcards at **Art Installation**. Wieczorek and Biggs of **Zines** defined their success as connecting with broader communities, such as local artists and residents, and subsequently hosting an academic *Zine Library* to engage with scholars who are passionate about expressing their artistic creativity through zines. Reflecting on success more broadly, Desjardins of **Documentary Shorts** shared their reflections regarding the success of AROs on top of each ARO's individual success: *"From the creator's perspective, one way I assess the success of an ARO is also how satisfied we feel with our design work being presented through the AROs. When confined to academic writing, there is often a lot that is left unsaid, which can lead to frustration as a designer. With an ARO, there is more freedom in presenting an authorial voice that can be highly satisfying as designers."*

It is important to note that ***we are not arguing that every HCI research project should produce an ARO***. Our case study analysis reveals that AROs emerge organically in the research timeline when appropriate. Circling back, this is why we suggest the three temporal concepts of ARO (Section 6.1.2) to visualize the timing and the roles of AROs. In our view, the primary value of AROs lies in reimagining how research is produced, shared, and experienced. Diversifying methods of disseminating research insights can inspire creative approaches to sharing knowledge, connecting researchers with specific audiences who are relevant, interested or deeply engaged in the research process, leading to a more inclusive research ecosystem. Overall, AROs ensure knowledge flows not only within academia but also across communities, disciplines, and contexts, transforming how we understand and share research. This multifaceted experience in designing, creating, and sharing AROs prompts open-ended inquiries: How do we, as researchers and designers, learn and produce knowledge? What modes of presentation and communication best capture the intricacies of our work?

6.2.4 Where do AROs belong in the academic context and beyond?. AROs prompt a re-examination of what "impact" means for research contributions to the academic community, which, in turn, prompts a reconsideration of how research is evaluated and recognized.

On the surface, AROs are best understood in the community and context they are meant for, reflecting on their *situational qualities*. How can AROs be effectively showcased and archived to ensure their presence and long-term impact within and beyond academic boundaries?

In the context of academia, dedicated tracks at international conferences can invite different types of AROs relevant to a conference's topics, attendees, and themes. This provides an open space for scholars to display their AROs and share the processes of design, theory, and crafting, which are the key components of design research. Conference tracks, such as *Pictorial*, *Artworks*, *Critiques*, and *Art and Performance* (mentioned in Section 2.2), offer potential venues for AROs to show their presence within the academic ecosystem. AROs can further initiate new venues, following the successful academic *Zine Library* hosted by the creators of **Zines** at DIS 2024 in Copenhagen. Participating projects and AROs at these tracks can be archived for future access (e.g., *Studio* at TEI 2023[28] and *Zine Library* at DIS 2024[29]).

There is an opportunity to explore the space between academic and public boundaries inspired by the Open Access movement to overcome the traditional barriers of institutional paywalls and subscription fees. One approach is hosting a dedicated ARO repository, similar to the online repository[30] that archives all pictorials. Tagging or grouping AROs by form, context, or other emerging features or characteristics could be helpful in organizing the ARO repository. Additionally, an asynchronous space to show, share, and archive AROs could be valuable. Inspired by "Question Bridge[31]", hosted for two years to facilitate conversations about design research asynchronously [81], a dynamic, emerging, and evolving online space for AROs could facilitate further engagement and conversation around AROs. These open spaces could be curated by scholars but grant full public access for free use, collaboration and communication with ARO creators and audiences.

Lastly, beyond the academic boundary, public events that bring researchers and the public together (e.g., *Work-In-Progress Festival*[32], *Science in the City*[33], and *The Great Exhibition Road Festival*[34]) are excellent venues for disseminating AROs. These events offer accessible platforms for researchers to share their work with wider audiences in engaging and interactive ways, bridging the gap between academia and the public while highlighting the societal relevance of research. Presenting AROs at public events establishes a direct channel to individuals who might not otherwise engage with academic research, raising awareness and illustrating the tangible benefits of research for the general public.

7 Conclusion

This paper introduces and articulates the concept of Alternative Research Outcomes (AROs) in HCI research. AROs challenge conventional norms of knowledge-sharing in written publications by embracing unconventional methods to disseminate research insights. As HCI research increasingly engages diverse groups of people and communities, sharing research insights creatively within a given context requires greater attention. Consequently, our aim is to offer an initial understanding of motivations, forms, and dissemination strategies shaping AROs, rather than to develop a comprehensive framework. Based on our first-hand experiences of working with sec ARO case studies, we identified four emerging qualities—*translational*, *situational*, *transparent*, and *initiatory*—as well as possible limitations and benefits of AROs. We acknowledge these qualities emerged in a small set of ARO cases in the field. We look forward to seeing more qualities that may surface from the creation of new AROs in the HCI and design community. AROs offer an opportunity to express and advocate for different commitments driven by care for research participants and relevant communities. From conceptualization to execution, working with AROs has offered value beyond the traditional metrics of academic success. We hope our work encourages recognition and broader discussion and exploration of AROs in and beyond the HCI and design research communities.

[28]https://tei.acm.org/2023/program/studios
[29]https://dis.acm.org/2024/zine-archive
[30]https://materialfordesign.net/pictorials
[31]https://designresearch.works/qubr-archive/index.html
[32]https://2024wip.cyens.org.cy
[33]https://scienceinthecity.org.mt
[34]https://www.imperial.ac.uk/festival

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