

# Leveraging Virtual Communities for Capacity Building in Complex HCI Environments

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This paper investigates the implementation and impact of a virtual Community of Practice (vCoP) designed to aid community-based organisations (CBOs) in Victoria, Australia, in developing multicultural digital messaging during the COVID-19 pandemic. Our goal was to evaluate the vCoP’s effectiveness in enhancing capacity and sustaining meaningful connections for participants beyond the study’s immediate scope.

Utilising Action Research (AR) and ethnography, we offer insights into the operational dynamics and effectiveness of vCoPs within complex environments. We identify crucial factors for optimising vCoP capacity building, focusing on (i) the participants and their roles, and (ii) the modes of engagement employed within the vCoP. This study provides a foundation for future research that incorporates these considerations, aiming to guide vCoPs in similar contexts, to build participant capacity within and outside the contexts of ongoing research. It also underscores the necessity for longitudinal studies to assess the long-term impacts and effectiveness of these strategies. Overall, this work contributes to the broader discourse on leveraging social learning within Human-Centred Computing (HCI) to address intricate challenges and support community empowerment in dynamic settings.

CCS Concepts: • **Human-centered computing** → **User studies**.

Additional Key Words and Phrases: CoPs, peer support, Community-based organisations

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## 1 INTRODUCTION

Human-Computer Interaction for Development (HCI4D) emphasises technological interventions to support and empower marginalised communities. However, emerging work highlights a growing awareness that HCI studies tend to focus on communities’ contributions to the creation of technological artefacts and frameworks, often overlooking broader strategies for empowerment and capacity building in the process [1][28].

Our research seeks to address this concern by considering a virtual Community of Practice (VCoP) as a means to foster long-term learning and collaboration. Our objective is to explore methods that ensure that community needs are

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53 addressed in ways that extends beyond the immediate scope of the research. In this study, we investigate community-  
54 based organisations (CBOs) working with marginalised communities. Specifically, we examined the use of a VCoP as a  
55 means to support CBOs in their efforts to create appropriate digital messaging and address the unique challenges faced  
56 by multicultural and multilingual communities in Victoria, Australia, during the COVID-19 pandemic.  
57

58 CoPs and VCoPs have been explored in related contexts, for example, providing support for healthcare professionals,  
59 community health workers (CHWs) or distance-learning educators [6][20]. However, there is limited research on their  
60 application in complex settings—environments that involve a diverse mix of large and small organisations, with varying  
61 backgrounds, resources, funding, and constraints. We aim to evaluate how effectively our VCoP supported CBO leaders  
62 in (i) developing the skills needed to design digital COVID-19 messaging and engage their communities (ii) build  
63 capacity and network connections that could be leveraged outside of the scope of this study.  
64

65 Based on the outcomes of our VCoP, we provide insights into designing and implementing CoPs that are resilient and  
66 adaptive to the needs of participants’ needs in other contexts. Beyond the immediate scope of the COVID-19 pandemic,  
67 this work addresses the persistent need for marginalised communities to establish sustainable communication channels  
68 and develop capacities to navigate ongoing structural challenges. Through this exploration, we contribute to the broader  
69 discourse on HCI and community empowerment by examining how CoPs can support skill development and capacity  
70 building for diverse stakeholders in complex settings beyond the scope of ongoing research work. Our study identifies  
71 key considerations for designing effective learning environments that address the complexities of diverse settings and  
72 participant backgrounds. This work emphasises the importance of understanding and optimising CoP elements to  
73 empower communities by addressing these dynamics.  
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76

## 77 2 RELATED WORK

79 Here, we examine the backdrop for our study and outline our research focus. Specifically, we explore the impact of  
80 COVID-19 on the Victorian population, highlighting the challenges faced by multicultural communities in Australia  
81 and the role of CBOs in mitigating these challenges. to contextualise our study. We review foundational work on CoPs  
82 and previous work in this space to establish a basis for our exploration and highlight gaps our work aims to fill.  
83  
84

### 85 2.1 COVID-19 and Australian communities

86 The outbreak of SARS-CoV-2 in December 2019 led to a global pandemic, as declared by the WHO in March 2020.  
87 Australia, aided by its geographical isolation, national wealth, and low population density, was among the first to impose  
88 strict lockdowns, close borders, and implement physical distancing measures, effectively slowing the virus’s spread.  
89 The state of Victoria, in particular, held the record for the world’s longest COVID-19 lockdown [26]. In February 2021,  
90 Australia launched a four-phase COVID-19 vaccination program, and by November 2022, more than 95% of Australians  
91 aged 16 and over had received two doses, with more than 72% receiving three [4].  
92

93 Despite high vaccination rates, public attitudes toward vaccines fluctuated. Hesitancy and resistance were notably  
94 higher in multicultural communities, largely due to the absence of culturally tailored communication strategies, which  
95 was exacerbated by feelings of exclusion from traditional communication channels and instances of racial abuse  
96 during the pandemic [2][5][11]. Ataguba & Ataguba (2020) observed that miscommunication during the pandemic was  
97 particularly severe in communities with weak trust in public authorities, as seen in many multicultural communities  
98 in Australia [3]. Healey et al. (2022) studied vaccine hesitancy among Ezidi refugee communities in rural Australia,  
99 highlighting how government messaging often failed due to inappropriate, text-heavy formats that were not well-  
100 received by these communities [14]. Local service providers, feeling unsupported, struggled with uncertainty about  
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105 the information they were disseminating, leading to further confusion. Pym et al. (2022) also found that multicultural  
106 communities tended to trust COVID-19 information more when it came from within their own cultural and linguistic  
107 groups, because it aligned better with familiar communication patterns [24].  
108

## 109 **2.2 Community-based organisations (CBOs) in Australia**

110 In Australia, support for multicultural communities often comes through CBOs. These not-for-profit entities are rooted  
111 in, and primarily serve minority communities, addressing local needs, enhancing social well-being, and promoting  
112 community development [9]. Unlike larger NGOs or INGOs that operate on national or international levels, CBOs  
113 function locally, involving community members in decision-making to ensure their work is culturally appropriate and  
114 aligns with community aspirations, often acting as intermediaries between their own communities, the government,  
115 the private sector, and other stakeholders [17][12][10][9]. In the aftermath of the COVID-19 pandemic and the ensuing  
116 lockdowns, it became evident that public health messaging from the Australian authorities was not effectively reaching  
117 multicultural populations [11]. These CBOs played a crucial role in promoting COVID-safe behaviours and encouraging  
118 vaccination by using communication methods better suited to their communities.  
119

120 However, many of these organisations are volunteer-led and grassroots. They serve minority populations and  
121 face significant resource constraints. These limitations extend beyond financial challenges to include inadequate  
122 infrastructure and skills. Recognising the crucial role of CBOs and understanding their need for better resourcing, the  
123 Victorian Government formed strategic partnerships and began to leverage relevant, digital tools to support and amplify  
124 their efforts, for example, partnering with The National Ethnic and Multicultural Broadcasters' Council (NEMBC),  
125 the peak organisation representing ethnic community broadcasters in Australia, to support production of a regular  
126 COVID-19 new bulletin for a range of multicultural communities [21].  
127

128 Building on the positive outcomes of these partnerships and recognising the need to better resource a diverse range of  
129 CBOs, the government launched the Multicultural Communications Outreach Program (MCOP) through the Department  
130 of Families, Fairness and Housing (DFFH) [30]. The MCOP aimed to fund multicultural community organisations to  
131 create and disseminate engaging content promoting COVID-19 vaccination and COVID-safe behaviours. The program  
132 also sought to build skills and capacity within these organisations.  
133

134 The grant was rolled out in two rounds, with the first in July 2021 offering \$2 million in funding and the second  
135 in February 2022 providing \$1.8 million. This funding covered expenses such as equipment, training, and translation  
136 necessary for content production, enabling multicultural communities to tell their own stories and effectively communi-  
137 cate public health messages [30]. Our VCoP was launched in response to the MCOP, to examine its capacity to support  
138 CBOs in creating digital artefacts, enhancing learning, and facilitating long-term knowledge transfer and connections  
139 beyond the duration of the grant. Our research involved close collaboration with various CBOs that represent and  
140 work with multicultural communities in Australia (also referred to as Culturally and Linguistically Diverse – CALD  
141 communities in some contexts) [13].  
142

## 143 **2.3 Theoretical foundations: Communities of Practice**

144 The term 'Community of Practice' (CoP), as coined by Wenger, serves as the foundational concept for this study. By  
145 definition, a CoP is a group of individuals with a shared interest who learn from each other through social interaction  
146 [31]. It comprises three core components: domain (shared interest), community (social relationships), and practice  
147 (shared knowledge). Learning in a CoP is a collective process, where members engage in activities, discussions, and  
148

problem-solving related to their common interest, together. This idea is central to situated learning, which emphasises the importance of social interaction and group participation to facilitate meaningful knowledge and skill transfer [19].

In recent years, CoP literature has continued to expand. Wenger (2011) proposed the concept of "social learning systems" in reference to CoPs, which refers to the broader structures and processes that support learning and knowledge creation within these spaces. He argued that social learning systems are essential for addressing complex sociocultural and environmental challenges [32]. Further work builds upon these ideas and outlines the network of roles and relationships between participants of a CoP that underpin both value generation and the process of social learning. Wenger-Trayner et al. (2023) provide an expanded framework that distinguishes between the key roles of traditional CoPs and identify two critical levels of leadership that guide their operation [33].

The two levels of leadership provide a framework for understanding how relationships within a CoP take shape:

- **Strategic engagement** involves aligning the CoP with broader organisational goals, ensuring that the community's efforts are supported by necessary resources. This level is primarily managed by sponsors and executives who are responsible for sustaining the CoP and resourcing it as required.
- **Operational leadership** focuses on the day-to-day functioning of the CoP, including managing activities, member engagement, and community development. Facilitators, community leaders, and core group members play pivotal roles here, ensuring the CoP remains active and generates value.

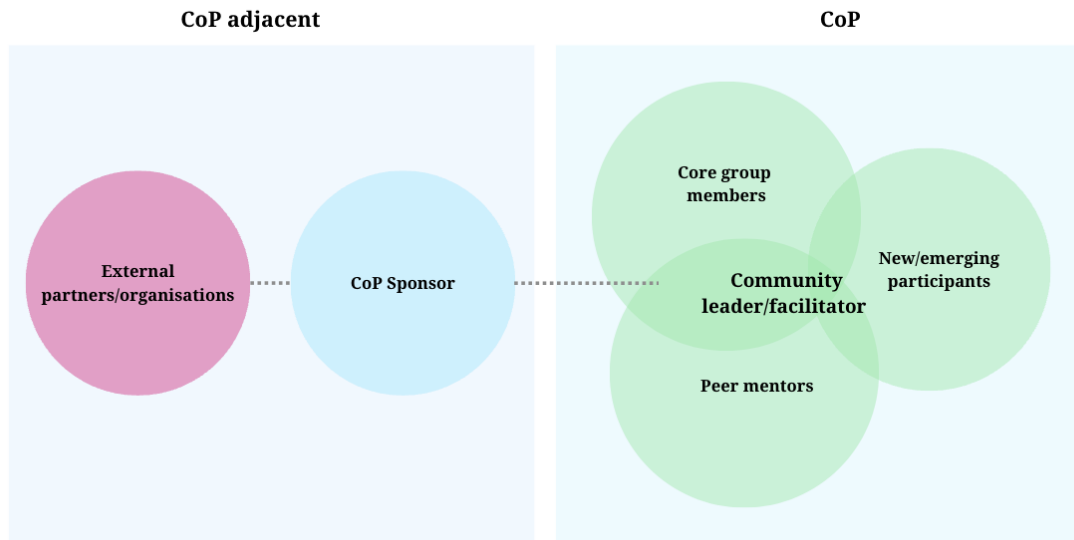


Fig. 1. Actors of the CoP

In this respect, it is important to expand upon the distinction between leadership roles: namely, sponsors and facilitators. Facilitators and community leaders handle daily activities and member engagement, and may also provide guidance to peer mentors or leaders that emerge within the CoP. In contrast, sponsors operate on the periphery of the CoP. They are responsible for overseeing the funding and resourcing needs of the CoP, and do not typically have

substantial involvement in its day-to-day operations [6]. They communicate primarily with operational leaders to ensure the CoP's sustainability without directly influencing its internal dynamics [33].

This expanded understanding of CoP roles underscores the significance of structured leadership and support systems in fostering effective knowledge exchange and collaboration. In the context of the MCOP, the DFFH, or funder, can be seen as a sponsor, ensuring the flow of resources to organisations within the CoP. The research team served as facilitators of the CoP, ingrained in the day-to-day activities of the learning space, with no direct association with the funder.

In HCI, recent research has investigated VCoPs as platforms for knowledge sharing and skill development, primarily within relatively homogeneous communities. Studies, for instance, have examined VCoPs in computing and higher education contexts, where participants share similar professional goals and expertise [15, 23, 29]. In more diverse settings, such as entrepreneurship [16] or investigative communities [7], VCoPs generally remain within specific domains where participants still share a common technical language and professional practices. While these studies offer valuable insights into VCoP engagement and dynamics, there is limited understanding of VCoP functionality in complex environments where participants come from varied backgrounds, hold differing levels of expertise, and have distinct organisational priorities. We address this gap by exploring how VCoPs can be intentionally designed and facilitated to support effective knowledge exchange across culturally diverse organisations, while managing the intricate power dynamics and relational complexities that arise when multiple stakeholders with divergent priorities and capabilities collaborate within a shared learning environment.

## 2.4 Challenge and research focus

Our research focus was to evaluate the role of a VCoP in supporting CBO representatives as they tackled the challenges of digital media production to engage their communities, exploring its potential to foster the transfer of sustainable skills and to cultivate networks that endured beyond the immediate context of the study, in line with the goals of the MCOP grant. We explored how the distribution and negotiation of roles and power dynamics within the VCoP influenced the quality, depth, and value of interactions, shaping the connections and outcomes generated by the CoP. Through this exploration, we aim to deepen the understanding of how VCoPs can be tailored to complex, culturally diverse environments, offering practical strategies for designing resilient, inclusive learning spaces for participants.

## 3 STUDY DESIGN

### 3.1 Participants and Context

The study involved 36 CBO representatives who were grant recipients selected by the DFFH. These participants represented diverse multicultural communities across Victoria. The participants varied in their roles within their organisations, ranging from community leaders to communications officers, and brought diverse levels of digital media experience. As grant recipients of the MCOP program, all 50 grantees were automatically enrolled in the VCoP, and 36 chose to take part. The research team consisted of three facilitators with expertise in digital media production, community engagement, and ethnographic research methods. This VCoP was conducted over a four-month period from February to June 2022, corresponding with the main phase of the MCOP grant, from the point of grant distribution to acquittal. The study was approved (32297) by the Monash University Human Research Ethics Committee (MUHREC) at the project's outset.

### 3.2 Action Research

Action Research (AR) was chosen as the primary methodological approach in this study, based on its adaptability and emphasis on context-specific problem-solving. AR integrates theory with practice through iterative, real-world interventions, making it well-suited for addressing complex social challenges like engaging CBOs in multicultural settings [25]. AR's iterative nature supported adaptive research practices, allowing us to respond to emerging insights and shifting community dynamics in real-time.

### 3.3 Ethnographic Approach

Digital ethnography was employed alongside AR to better understand the operational dynamics of CBOs serving multicultural communities[22, 27]. Our approach involved sustained digital immersion through the VCoP platform, regular interactions, and consistent engagement with participants through multiple channels adjacent to the community. The lead researcher maintained a continuous presence in the online community participating in all virtual activities, conducting weekly calls, and documenting observations of community dynamics and cultural practices as they emerged in the digital space. This immersion in our community context provided a detailed exploration of the complex challenges these organisations faced. The trust and rapport built through this immersive approach were essential in addressing any misconceptions or confusions that emerged during the research process.

### 3.4 Unplatformed Design

The VCoP was hosted on a private Facebook group, chosen for its user-friendly interface and broad accessibility. This aligns with the principles of 'unplatformed design,' which emphasises the use of technology as an unobtrusive, transparent tool, allowing users to focus on the task at hand than the technological medium itself [18]. Given the varied digital literacy among CBO participants, this approach ensured that the focus remained on engagement rather than on mastering new technology.

### 3.5 Facilitating the CoP

Drawing from Mueller et al.'s insights on online learning during COVID-19, we strived to embrace and leverage participant diversity to foster genuine, long-term engagement [20]. The private group served as a secure platform where MCOP grant recipients could connect, exchange insights, and collaborate on media projects. The research team worked consistently to create an environment that supported equitable participation and drew upon the diverse backgrounds and experiences of the participants, by connecting with participants one-on-one, and curating dynamic forms of information-sharing and engagement.

The Facebook group was actively moderated by three members of the research team, who focused on facilitating the CoP, guiding discussions, and maintaining relevance to the participants' media production projects. This moderation was critical in sustaining the momentum of the CoP, encouraging ongoing participation, and keeping discussions aligned with the CoP's objectives.

In addition to the group interactions, the 'Grapevine' component involved weekly, informal phone calls with CBO representatives, and videos which incorporated these insights and ideas. These phone calls, conducted with two to three representatives each week, focused on their progress, challenges, and significant stories related to their media production efforts. The content generated from these calls was synthesised into scripted videos, which were shared

CoP Element	About	Participant action
Facebook Group	The research team hosted and moderated a private Facebook Group	Participants were free to post, ask questions and communicate with one another and the researchers
Grapevine phone calls	The lead researcher called 2-3 participants a week to discuss informal project updates	Participants shared project updates, insights, and/or challenges with the researcher
Grapevine videos	The lead researcher compiled insights from the Grapevine phone calls for short videos to share on the Facebook Group	Participants watched and were free to interact with or respond and draw inspiration from the video posts
Panel discussions	The research team and panelists presented on relevant topics to the participants via Zoom	Participants could engage and ask questions during the open forum section

Fig. 2. Elements of the CoP

with the entire group on Facebook, as a means of digital storytelling. Across the CoP's duration, a total of nine videos were produced and shared, enhancing the sense of community and shared purpose among participants.

The third component of the CoP consisted of monthly panel discussions, each lasting one hour, and addressing key topics relevant to participants' media production journeys. These sessions featured expert guest speakers and covered subjects such as Media and Ethics, Communicating Health Messages Creatively, Storytelling for Impact, and Savvy Self-Promotion. These discussions provided valuable knowledge and were intended to generate long-term learning value like beyond the CoP and foster a sense of community among the participants and the facilitation team, reinforcing the collaborative nature of the CoP.

### 3.6 Data Collection and Analysis

Data collection for this study was carried out concurrently with the facilitation of the CoP, informed by the principles of both AR and Ethnography. This dual-method approach allowed for deep immersion into the emerging culture of the CoP and facilitated a comprehensive understanding of participants' practices, interactions, and experiences [27].

The primary data sources included:

- **Participant observation:** The researcher, acting as an embedded ethnographer within the CoP, engaged in extensive participant observation. This involved partaking in CoP activities and systematic observation of interactions among participants. The observations were documented as field notes, providing a rich source of qualitative data.
- **Grapevine calls:** The weekly informal calls with CBO representatives served as ethnographic interviews, offering first-hand narratives about participants' progress, challenges, and success stories. Detailed notes and reflections from these calls were documented in subsequent scripts and weekly videos, further enriching the qualitative data.

- 365 • **Panel discussion recordings:** Monthly panel contained an open forum component, providing insights into  
366 shared learning and community dynamics within the CoP. These sessions were recorded and transcribed,  
367 offering a valuable textual dataset for supplementary analysis.
- 368 • **Facebook interactions:** The social interactions within the private Facebook group were analysed using  
369 digital ethnography. Posts, comments, likes, and shares were tracked and documented, enabling a nuanced  
370 understanding of community dynamics, engagement levels, and the emergence of shared themes and discussions.
- 371 • **Personal reflections:** Throughout the facilitation of the CoP, the lead researcher maintained a regular reflection  
372 log, documenting ethnographic insights, reflections on the research process, and interpretations of the evolving  
373 dynamics within the CoP.  
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377 Thematic analysis, as outlined by Braun and Clarke (2006), was employed to analyse the collected data [8]. The  
378 process began with familiarisation, which involved reviewing session recordings, reading transcripts, and examining  
379 ethnographic notes to gain an initial understanding and identify emerging patterns. Codes were generated to pinpoint  
380 key ideas relevant to the research questions, and these were refined into broader themes that highlighted how the CoP  
381 facilitated collaborative interactions and met its objectives. The analysis was informed by Wenger’s Community of  
382 Practice (CoP) theory [31], ensuring that the findings were grounded in established theoretical frameworks. The most  
383 critical insights of this study stem from the reflective data gathered by the research team throughout the facilitation  
384 and analysis of the CoP.  
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#### 387 388 4 REFLECTIONS

389 Our insights on the implementation of the CoP emerge from iterative reflection, guided by our AR approach. This  
390 reflective practice was key to navigating the complexities and obstacles participants encountered, enabling us to evolve  
391 the CoP to more effectively address their needs. Through this reflective analysis, we became acutely aware of the  
392 broader significance of this work in addressing the persistent challenges of creating effective digital spaces for diverse  
393 stakeholders, especially in complex situations where power dynamics are often exacerbated.  
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##### 396 397 4.1 Navigating tensions between the sponsor and the community

398 Throughout the CoP, CBOs faced significant challenges as they navigated the digital media landscape, caught between  
399 the competing demands of their communities and the expectations imposed by the funders. The MCOP grant, while  
400 offering a critical opportunity to enhance communications within their communities, introduced a new layer of  
401 complexity, based on pressure to use funds and resources in an appropriate manner. This balancing act required CBOs  
402 to learn and produce digital content that resonated with their communities while simultaneously adhering to the  
403 guidelines stipulated by the DFFH. CBOs like those represented by participants C9 and C30 channeled their resources  
404 into creating media-based training programs, recognising the importance of tailoring content to their communities’  
405 unique needs.  
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408 However, this process was not straightforward. Participants consistently highlighted the tension between producing  
409 content that was culturally and linguistically appropriate and satisfying the funding criteria. For instance, participant  
410 C13, who aimed to promote vaccination among middle-aged Greek labourers in Melbourne, planned to use a comedic  
411 sketch laced with profanities to resonate with his audience but expressed concerns that VicGov might reject the content  
412 due to its tone, illustrating the precarious position CBOs found themselves in: trying to stay true to their communities  
413 while navigating the perceived power of the funders.  
414  
415



417 This challenge was exacerbated by varying levels of digital literacy and media production skills among the CBOs.  
418 The expectation to produce high-quality digital content, despite many participants being new to such endeavours,  
419 underscored the imbalance of power in this relationship. Some participants were reluctant to admit their weaknesses  
420 or shortcomings, fearing that this could jeopardise their standing with the funding body due to a lack of trust in the  
421 government's willingness to accommodate these variances.  
422

423 An interview with a representative from the department overseeing the MCOP grants (C32) revealed bilateral  
424 recognition of the trust gap between government and communities: *Government channels and mainstream channels*  
425 *were only going so far in getting the message out there. Some people just don't want to engage with government due to,*  
426 *you know, negative experiences in the past from their home country or from here.* This acknowledgment of the complex  
427 power dynamics between community organisations and governments underscores the need for a flexible, context-aware  
428 approach when engaging with CBOs in such intricate settings. The failure to navigate these dynamics effectively can  
429 not only inhibit open communication but also stifle the collaborative learning necessary for the long-term success  
430 of the CoP. Without addressing these tensions, the potential for meaningful connections and sustained knowledge  
431 exchange remain significantly compromised.  
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## 436 4.2 Delineation of roles

437 The complexities of navigating power dynamics were closely intertwined with the challenge of clearly delineating  
438 roles within the collaborative space. While CBOs grappled with balancing community needs and funder expectations,  
439 another layer of complexity emerged: the confusion over the distinct roles of the facilitators, in this case the university  
440 researchers, and the sponsors, or government funders.  
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443 As CBOs initially conflated the roles of the researchers (facilitators) with those of the funders (sponsors), it led to an  
444 atmosphere of formality and caution, complicating the collaborative process. Many of the participating CBOs did not  
445 understand the distinction between the two entities, and entered the CoP with apprehension, perceiving the researchers  
446 as proxies for the government funder, tasked with monitoring grant recipients' progress. This was evident in early  
447 interactions, such as when participant C24 requested that the researcher relay to DFFH that, *he knew what he was*  
448 *doing, and, was very experienced in this domain.* This conflation of roles stifled participation and genuine engagement  
449 from the outset. CBOs, aware of their accountability to DFFH and their expectations regarding the MCOP grant, were  
450 initially guarded in their interactions, perhaps fearing that deviations from grant guidelines might be reported back to  
451 the funder by the researchers.  
452  
453

454 However, as the CoP progressed, this atmosphere began to shift. Recognising these apprehensions, the researchers  
455 made deliberate efforts to clarify the university's position, emphasising their role as facilitators rather than monitors.  
456 Trust-building efforts through transparent communication, particularly via Grapevine calls and videos, began to yield  
457 positive results. It is important to note that this was an observed shift in the attitudes of the participants rather than  
458 documented with explicit quotes. For example, some participants began to interact more freely with the research team  
459 and also took the initiative to connect with the lead researcher, inviting her to events outside of the context of the CoP.  
460

461 This evolution was an iterative process that required ongoing reassurance with respect to clarifying roles from the  
462 researchers. Over time, participants became more open, sharing challenges and discussing project details without fear  
463 of judgement. The gradual shift from initial mistrust to a more collaborative dynamic highlighted the importance of  
464 fostering trust through consistent, transparent communication, in particular, explicitly delineating the roles relationships  
465 of the CoP.  
466  
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### 4.3 Facilitating collaborative knowledge exchange

The CoP effectively created an environment for knowledge exchange, with participants engaging in collective learning at various degrees. The creation of this atmosphere was supported by careful facilitation on the part of the research team, which was customised to meet the diverse needs of the participating CBOs, from large organisations to smaller groups. CBOs' proximity to their communities provided valuable tacit knowledge, which the CoP helped convert into shareable, explicit knowledge. As one participant noted, *First of all, I think it was incredibly important that we had some sort of ballast or some way to reflect on what we did... Because it was kind of an uncharted territory* [C13].

A key element of the CoP's success was the use of various strategies to encourage knowledge sharing. Structured panel discussions, informal Grapevine calls, and moderated Facebook group interactions created multiple channels for participants to be involved, glean insights, and collaborate with one another. This approach allowed participants who were uncertain or less confident to gradually immerse themselves and engage at their own pace. As one participant noted, *I am new to all this, so I felt like I wasn't contributing all the time, but I got to learn a lot from the panel sessions* [C26]. The research team also facilitated inter-group connections to enable peer-to-peer mentorship as an additional channel for knowledge sharing within the CoP. More experienced representatives were able to guide less experienced members and offer advice on digital media production. This horizontal flow of knowledge was evident in interactions like the one between C10 and C13 during a Panel Discussion session, where C13's expertise helped guide C10's media production for the Greek community. This proactive approach helped bridge gaps between organisations of different sizes and capacities, ensuring equitable knowledge sharing.

Additionally, the Facebook group facilitated quick exchanges and provided a platform for immediate problem-solving. As noted by another participant, *I'm really happy with the Facebook group. Every time I do something, it's good to have a group so we can exchange ideas. And it's a really good way to communicate with [Action Lab] because when I have something that I need answered now, Facebook is a good way to ask* [C10]. The weekly Grapevine videos, posted to the group, served as a shared repository of knowledge, offering insights into others' journeys and fostering a sense of community. *I really enjoy watching those videos. It's interesting the range of ideas other organisations have*, said C3.

The carefully curated CoP structure also addressed previous misconceptions about power dynamics between stakeholders of the CoP and promoted openness and vulnerability. As participant C3 reflected:

*When we worked with government funding in the past, we often felt the pressure to present an image that we were doing well with the projects, which in reality is not always the case... But with this group [CoP], it was different as I felt like I could openly share our challenges and get advice from other people without fear of judgement. It was kind of comforting to know that other organisations have faced similar challenges too*

The research team's ongoing efforts to connect participants, moderate discussions, and create a variety of structured learning opportunities ensured that all members could both contribute to and benefit the CoP. This approach enriched engagement and allowed for the development of genuine skill development and social connection, in line with the goals of the study, and the broader MCOP grant.

## 5 DESIGN CONSIDERATIONS

Our reflections underscored two pivotal areas essential for cultivating an environment to support sustained and meaningful learning beyond the scope of the VCoP. Grounded in our context of the public health crisis in Victoria, these insights have broad relevance as organisations across the globe increase their reliance on virtual platforms for capacity building and knowledge exchange, particularly in collaborative efforts that span diverse organisational

521 contexts. First, it was crucial to address the relationships among the actors and participants involved, to encourage  
 522 uninhibited interaction. Second, implementing dynamic and varied modes of engagement, with substantial support  
 523 from the research team proved critical in fostering active participation and establishing momentum within the VCoP.  
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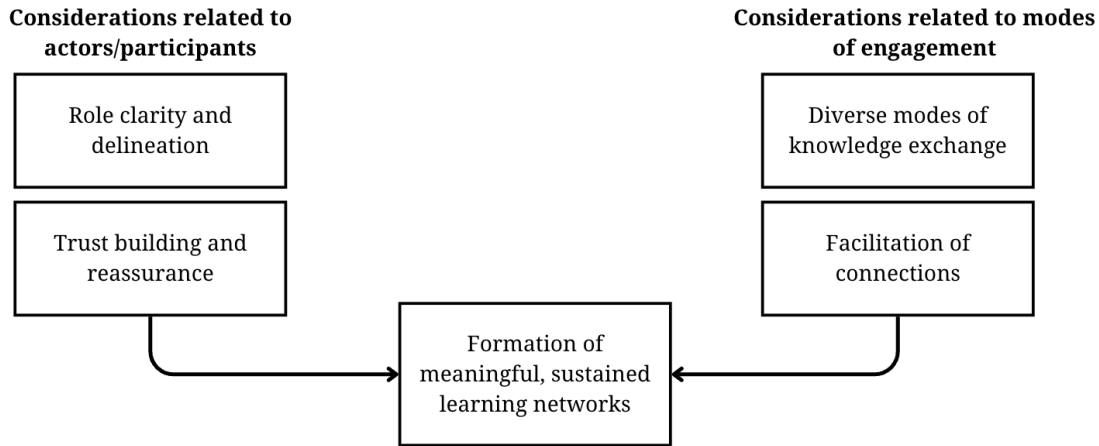


Fig. 3. Design considerations for sustained engagement

548 . **Considerations related to people/actors:** These considerations pertain to the perceptions of, and relationship  
 549 between the various stakeholders of the CoP.  
 550

- 551 • *Role clarity and delineation:* Based on the power dynamics between the external sponsors and core group of this  
 552 CoP, the research team discovered a need for explicit delineation of roles within the learning space. Emphasising  
 553 the distinction between sponsors as mere resourcers of the space, and facilitators as active members and  
 554 supporters of the participant group was crucial for fostering an environment conducive to uninhibited learning.  
 555 This distinction needs to be clearly communicated from the outset, and revisited regularly. The CoP cannot  
 556 function under the assumption that participants have a clear understanding of these roles, especially in complex  
 557 environments where the power imbalance between the core group of the CoP and the sponsoring entities is  
 558 vast.  
 559
- 560 • *Trust building and reassurance:* Directly connected with clarification around roles and relationships, was the  
 561 iterative trust-building work carried out by the researchers over the lifespan of the VCoP. The researchers  
 562 needed to offer genuine reassurance, demonstrate empathy, and encourage open, uninhibited sharing to create  
 563 a supportive environment. This involved understanding participants' concerns, validating their experiences,  
 564 and addressing any anxieties consistently, and doing so in an informal context - as observed on the Grapevine  
 565 calls. Creating the foundation for meaningful social interaction, and allowing participants to be vulnerable  
 566 within the boundaries of the CoP is crucial for building enduring and impactful networks.  
 567

568 **Considerations based on modes of engagement:** These considerations focus on tangible interactions and methods  
 569 by which actors in the CoP engage with one another.  
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 572

- *Diverse modes of knowledge exchange*: Effective knowledge sharing within a VCoP required a multi-faceted approach, combining structured activities like panel discussions with more informal methods like creating the Grapevine content and connecting participants for peer-to-peer mentoring. This was an especially important consideration given the diversity of organisations represented within the space, accounting for smaller organisations that preferred to participate on the periphery, or needed time to develop confidence and skills to share. Offering multiple avenues for involvement accommodates different comfort levels and encourages broader participation. This approach facilitates staged learning and helps ensure that hesitant members are not alienated, setting the foundation for more meaningful, sustained engagement.
- *Facilitation of meaningful connections*: Integral to the modes of knowledge exchange was the research team’s effort to foster connections, and opportunities for mentorship between participants. The team’s work to curate participant networks created additional channels for knowledge exchange within the VCoP, which could be leveraged outside of the learning space as well. Facilitating participant connections proved crucial, as it enabled the development of relationships extending beyond the VCoP. This approach fostered meaningful engagement within the study and laid the groundwork for networks that could provide long-term value.

## 6 DISCUSSION AND FUTURE WORK

Our work examined the efficacy of leveraging a VCoP to build capacity and foster long-term learning for CBO representatives in Victoria, as they navigated the challenges of producing digital COVID-19 messaging for their communities. The findings of this work have implications beyond the study setting, highlighting key considerations to bring together stakeholders in complex settings to facilitate capacity building and knowledge sharing in a digital environment during, and beyond the study.

Our experience revealed insights related to (i) the participants and their roles, and (ii) the modes of engagement employed within the VCoP. Our findings indicate that several design considerations are essential for establishing a sustainable CoP beyond the scope of the study. These include clearly defining the roles of key stakeholders, fostering trust through iterative processes, offering diverse engagement opportunities, and facilitating participant connections.

This study establishes a foundation for future research by incorporating these insights to guide the design and implementation of VCoPs in similar contexts, to build participant capacity both within and beyond the immediate research environment. Additionally, it underscores the need for longitudinal studies to evaluate the sustained impacts and effectiveness of these strategies, and empower participants in diverse and complex settings.

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