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Richter, I; Gabe-Thomas, E; Maharja, C; Nguyen, TH; Van, Nguyen Q; Praptiwi, R; Pahl, S

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10 Abstract

11 In the wake of the current global pandemic, international travel is restricted. This poses substantial
12 challenges for research relationships aiming to build capacity and foster co-creation to achieve the
13 Sustainable Development Goals, where global collaboration and communication is paramount. This
14 is especially challenging when it comes to interactive dialogues that go beyond the typical one-way
15 structure of online learning. Considerations on structural, technical and behavioural levels is needed
16 to not only deal with these challenges but rather to take advantage of the new situation. This
17 commentary outlines the lessons learned from an internationally operating project, co-developed to
18 cope with travel restrictions. We discuss implications for future reduction of international travel to
19 reduce carbon in the context of climate change.

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23 Keywords

24 Capacity building, global relationships, virtual communication, co-creation, sustainability

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Introduction

27 The Sustainable Development Goals (SDGs) address global challenges including climate change,
28 equality, education and health for peace and prosperity. To create and implement evidence-based
29 solutions, we need effective and targeted capacity building firmly embedded within best research
30 practice (Division for Sustainable Development Goals, 2015). Such research capacity must be built on
31 close communication and interaction across international borders. However, researchers are
32 experiencing substantial challenges in delivering these activities due to current mind shifts towards
33 criticising and shaming airplane travel (Flygskam movement) in combination with travel restrictions
34 due to the coronavirus disease (COVID-19) (WHO, 2020). This is an opportune moment to develop
35 best practice for virtual interactions, which will not only facilitate working under the current
36 circumstances but will allow us to reduce the carbon emissions generated by international projects
37 in the future (Achten, Almeida, & Muys, 2013; Verplanken & Roy, 2016). The present commentary
38 highlights practices, challenges and suggestions related to capacity building we undertook within the
39 Global Challenges Research Fund's Blue Communities project (www.bluecommunities.org/Home)
40 where researchers had to rapidly adjust delivery for participants from four countries from a face-to-
41 face capacity-building program to a virtual format.

42 Capacity building is defined as “building abilities, relationships and values that will enable
43 organisations, groups and individuals to improve their performance and achieve their development
44 objectives” (UNEP, 2002, p. 11). Whilst developing countries are often perceived as the receivers of
45 capacity building from more developed countries, it is important to recognise the bidirectionality of
46 this relationship, as researchers from both sides have valuable knowledge, experience and skills that
47 can be transferred. For the benefits of capacity building to reach all participants co-creation is key
48 (multiple actors are equally empowered and develop pathways to achieve mutual outcomes) to the
49 process. Capacity building and co-creation typically involve a high degree of skill-based and practical
50 training, requiring a high degree of interactivity, which traditionally takes place face-to-face. The
51 current restrictions in international travel as well as the goal to cut down on carbon emissions
52 challenge us to create ways of building capacity via virtual channels.

53 Current practices of virtual interaction include online learning, online conferences, webinars,
54 livestreams as well as virtual meetings. While some of those practices (e.g. webinars) emphasise
55 knowledge transfer and are often not interactive, others can be interactive (e.g. virtual meetings)
56 but this potential interactivity is not yet fully exploited. The academic community has responded
57 quickly to the challenges of delivering remote teaching. Although the teaching can be highly
58 interactive, they are rarely co-created and often simply replace traditional formats of talks and
59 presentations. Projects striving for mutual capacity building and co-creation (Chemi & Krogh, 2017)
60 are in need of innovative ways to deliver the bidirectional transfer of knowledge, the acquisition of
61 new techniques as well as providing room for flexibility and discussion.

62 The Global Challenges Research Fund (GCRF) Blue Communities Project connects researchers from
63 five countries (Indonesia, Malaysia, the Philippines, the United Kingdom and Vietnam) with the aim
64 of building capacity and delivering research on sustainable management of coastal communities and
65 marine ecosystems in Southeast Asia. Like thousands of research teams around the world, Blue
66 Communities is facing the challenge to keep meeting the project's goals without the benefits of face-

67 to-face interactions during joint field visits (Holton, 2001). Considering the current situation we are
68 forced to explore how we can build trust and dialogue, deliver international capacity building and
69 advance research activities through virtual interactions.

70 Here, we describe lessons learned from a capacity building workshop originally intended to take
71 place in Indonesia with participants from four countries (Figure 1). Due to the outbreak of the
72 COVID-19 virus, the workshop was held remotely. The aim of this workshop was to build local
73 capacity by demonstrating and co-creating various methods of running stakeholder workshops in the
74 respective coastal communities. This type of capacity building requires a highly interactive exchange
75 as the learning process is multidirectional. In our case, the UK partners were supposed to deliver
76 methods training in social and behavioural science. The three case study partners from Indonesia,
77 Vietnam and Malaysia were to contribute with their expertise in ecology, fisheries and marine
78 biology and with in-depth information about the selected sites. The ideal outcome of the workshop
79 would be a co-developed project plan with methods flexibly adapted to each site.

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Figure 1 to be inserted here

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85 **Figure 1:** The four countries (Indonesia, Malaysia, United Kingdom and Vietnam) participating in the virtual capacity-
86 building workshop (as depicted with the red lines) on stakeholder interaction that will be carried out in the case study sites
87 (Taka Bonerate Kepulauan Selayar Biosphere Reserve, Tun Mustafa Park, Cu Lao Cham and Palawan; as depicted with the
88 orange bullets)

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91 With the aim to welcome the challenge and to deliver high-quality outputs according to the funder's
92 standards and our personal project goals, we had to adapt across three dimensions: behavioural,
93 structural and technical. Behavioural adaptation covers all conscious amendments we identified to
94 optimise interpersonal communication, group leadership and engagement. Structural and technical
95 adaptation encompasses the consideration of different time zones, internet connectivity and
96 additional equipment. In the following section, we present our identified key considerations across
97 these three dimensions. Subsequently, we are going on to discuss the advantages and disadvantages
98 of the virtual format and ending with some recommendations. Our insights are by no means meant
99 to be exhaustive and can be extended or transferred to other virtual workshops requiring a high
100 level of engagement and interaction.

101 Behavioural, Structural and Technical 102 Considerations

103 The Importance of Icebreakers

104 Getting to know each other or building new rapport might be neglected when connecting online
105 from multiple locations. We claim that with the added physical distance, it is even more important
106 to establish personal connections between participants to make up for the lack of non-verbal
107 communication. Some but not all partners in our workshop had already established working
108 relationships. To build rapport we asked everyone joining the meeting to describe him- or herself in
109 three short sentences including the professional background and expertise as well as a personal fun
110 fact.

111 Facilitating Communication

112 We found that communication can be challenging in virtual settings, especially with poor
113 connection. Therefore, we used multiple routes of communication. These routes involved pre-
114 workshop email exchange to develop the agenda and the workshop aims, collect topics to cover and
115 to discuss a code of conduct. During the workshop we used a chat box within the software for all
116 participants to ask questions. Workshop leaders took turns to monitor the chat box. In addition, we
117 used email and phone conversations after the workshop to cover additional topics that could not be
118 covered or required more expansion to provide closure.

119 We found having at least two people present in the same room per location was helpful, if this is
120 possible given regulations on social distancing. This helps to stay on top of the multiple pathways of
121 communication, share responsibilities and avoid the likely exhaustion that will occur during virtual
122 capacity building (Schoenenberg, Raake, & Koeppel, 2014). That said, we still experienced virtual
123 capacity building as exceptionally draining for all parties involved, listening or presenting, which
124 makes it absolutely necessary to have regular breaks (Connelly, 2018). For this reason, we split the
125 originally planned one-day workshop into three consecutive sessions, in an attempt not to overload
126 workshop leaders or participants. This also considered time differences between countries.

127 Communication Fine Tuning

128 Many subtle interactions that enable a face-to-face workshop cannot be directly transferred to
129 virtual capacity building. In order to effectively communicate, cooperate and empathise with our
130 colleagues we needed to find creative solutions. Compared to face-to-face workshops we cannot get
131 an accurate feel if our partners are still motivated, tired or confused. Especially for the presenter it
132 can be a daunting experience not to receive the verbal and non-verbal reassurance that would be
133 implicit in any face-to-face interaction. Research has shown that very small delays (above 1200ms) in
134 visuo-audio feedback can lead to negative perceptions of participants on a personal level

135 (Schoenenberg et al., 2014). It is crucial to create a perception of social presence despite the physical
136 distance created by online communication (Aragon, 2003). Establishing a combination of information
137 transfer, group work, result demonstration, discussion and breaks allows all participants to actively
138 engage using the various channels of communication, and to efficiently switch between individual
139 listening, individual responding, joint practicing, social discussing and recovering (Anzai & Simon,
140 1979; Chang, Benamraoui, & Rieple, 2014; Hiltz, Coppola, Rotter, Turoff, & Benbunan-Fich, 2000;
141 Yang & Liu, 2004).

142 **Time Management**

143 This brings us to the importance of time management. We experienced that virtual capacity building
144 required more time than standard capacity building. This is due to materials that have to be adapted
145 or prepared, the need for more breaks during the workshop, but also potential time lags between
146 the sending and the receiving party making it necessary to repeat sequences more frequently. The
147 Blue Communities capacity-building program had to be planned across three time zones with up to
148 eight hours of time difference. Ideally, workshops like this would take place during working hours for
149 all parties involved. In reality, global interactions force us to be flexible. In our case, this meant that
150 some teams connected during early mornings or late evenings. Collectively deciding on a time
151 schedule that best suits the majority of participants is crucial.

152 **Attitude & Motivation**

153 When capacity building takes place remotely, a higher level of commitment is required than would
154 be necessary for a face-to-face workshop (Mroz, Landowski, Allen, & Fernandez, 2019). We tried to
155 accomplish this by carrying a very positive, energised mind-set and by creating an inclusive meeting
156 atmosphere as recommended by Schneider et al. (2018). To benefit from the combination of direct
157 and indirect interactions, wherever possible people from the same location should gather physically
158 in one room and interact directly whilst interacting with the groups in other locations virtually. This
159 helps to mix the virtual interaction with immediate collaboration but social distancing rules might
160 mean participants have to connect separately, an additional strain to connectivity.

161 **Connectivity Equipment & Platform**

162 Obvious technical and structural requirements include a good internet connection, meeting rooms
163 and relevant equipment. A stable internet connection can be problematic, especially in developing
164 countries or remote areas as was the case for the Blue Communities project. We experienced
165 interruptions during the meeting, difficulties in uploading and downloading materials as well as
166 impeded functionality of different communication channels.

167 We established a set of instructions for 1) very strong bandwidth: all partners share their video and
168 audio settings 2) partially problematic bandwidth: partner with problematic bandwidth to turn off
169 video, all turn off audio apart from when they speak 3) problematic bandwidth: all partners turn off
170 video and audio settings with the exception of the current speaker. This code of conduct was
171 familiar to all parties involved, leading to fluent communication across conditions.

172 An important factor is the use of a platform that enables sharing screen, text chatting and uploading
173 documents and pictures. These functions are essential for a high level of interactivity, as is the use of
174 a good quality camera by the workshop leaders. We found a movable camera with zooming and
175 focusing function to be particularly useful for ensuring interactive materials (flip charts and post-it
176 notes) were legible on screen. We also found microphone quality to be important as better
177 microphones reduce communication issues due to different mother tongues.

178 **Supporting Materials**

179 A crucial element was the use of comprehensive supporting materials. A pre-workshop checklist was
180 distributed to all participants. Some items might seem self-evident in the context of face-to-face
181 workshops, but they might be forgotten in virtual interactions (e.g. flip charts and post its). We
182 found the mixture of physical and electronic materials useful.

183 As an additional resource, we prepared an electronic handbook, which contained a literature list,
184 methods and data analysis instructions. This helped to reduce the reliance purely on audio/video
185 information. The scope of the handbook went beyond the content of the workshop itself and
186 complemented other materials such as PowerPoint slides, which all were adapted to the new
187 purpose of virtual capacity building. We identified visuals a key form of communication as they can
188 be understood across language barriers and despite poor audio connections (Susskind, 2005; Tufte,
189 2003).

190 **Discussion**

191 In his last section, we will discuss how we found ourselves benefitting from this novel situation as
192 well as struggling with challenges we did not fully overcome. We will conclude with the main lessons
193 learned to facilitate current and future projects relying on remote capacity building.

194 **Finding Advantages in the Crisis**

195 As a side effect of restricted travel, remote capacity building can reduce travel related carbon
196 emissions beyond the pandemic. In addition, remote capacity building gives rise to more advantages
197 than carbon emission savings.

198 **Strains on Resources & Health**

199 Online capacity building workshops are a less costly way to achieve international skills and
200 knowledge transfer than face-to face interactions. Costs for travelling, accommodation, meeting
201 rooms and catering are reduced drastically. Along with the financial savings comes the time saved
202 that is usually spent on planning, layovers, environmental adaptation and jetlag. This means that not
203 only are virtual meetings more cost-effective but they also take less toll on our physical and mental
204 wellbeing. We remain located in our familiar environment and time zone, which is in line with our
205 evolutionary circadian rhythm (Minors, Scott, & Waterhouse, 1986; Reilly, Waterhouse, & Edwards,

206 2005; Srinivasan et al., 2010). At the same time, we need to be aware that the rise of virtual
207 meetings, home office confinement and movement restrictions during a pandemic can have
208 negative effects on our physical and mental health (for overviews see Ammar, Brach, et al., 2020;
209 Ammar, Chtourou, et al., 2020; Ammar, Mueller, et al., 2020). Bentlage et al. (2020) as well as
210 Chtourou et al. (2020) provide a range of evidence-based, practical recommendations of how to
211 mitigate the psychosocial strain during home confinement, for example by remaining physically
212 active.

213 Equality

214 Despite the aim to bridge the distance imposed by the virtual connection, there might also be
215 advantages coming with the distance itself. People who struggle with face-to-face interactions might
216 be able to communicate better without the presence of direct cues used to detect potential negative
217 feedback from others (Stritzke, Nguyen, & Durkin, 2004). Similarly, virtual capacity building
218 facilitates the inclusion of people for whom participating under traditional circumstances would be
219 difficult or impossible (Pearson & Koppi, 2002). However, we need to be aware of setup adaptation
220 for participants with sensory or cognitive impairments. This includes the appropriate use of visuals,
221 the availability of additional supporting resources, the awareness of individual limitations and an
222 active communication network between participants for mutual support. We also need to be aware
223 that the intensified use of virtual technology bears the risk of causing further inequalities due to
224 differences in accessibility of such technology and opportunity to acquire relevant skills. Cultural and
225 gender related stereotypes are potentially less problematic for virtual collaborations than they
226 would be in face-to-face interactions. There may be a reduced risk of cultural or religious offence
227 due to inappropriate clothing, catering or schedules, especially if the workshop is co-created.

228 Disadvantages to Overcome

229 Despite the potential benefits of remote capacity building, we think it is important to acknowledge
230 some disadvantages that we were unable to overcome in the limited time we had available during
231 this crisis. We invite suggestions for strategies to help overcome these remaining barriers.

232 Language Barriers

233 Some challenges like cultural and gender-related roles and stereotypes seem to be diminished
234 whereas some other challenges seem to be enhanced in remote communication. Language barriers
235 are always a challenge within international collaboration. However, understanding each other and
236 adapting to different linguistic varieties might be even more difficult in virtual settings and lead to
237 disruptions or compromised team functioning (Klitmøller & Lauring, 2013; Neeley, Hinds, &
238 Cramton, 2012). On the individual level, uncertainty and diminished comprehension can lead to
239 confusion or frustration and in the worst case to the refusal of active engagement (Barner-
240 Rasmussen & Björkman, 2007). These challenges might lead to attempts to catch up with the
241 content in parallel or being prone to external distractions. Overcoming these challenges takes
242 patience by all team members, the provision of excellent supplementary material as well as the
243 willingness to answer questions continuously.

244 Participant-to-Participant Interaction

245 While adequate trainer-participant interactions are relatively easy to realise and are perceived as
246 normal and necessary, this may not be the case for participant-to-participant interaction. In our
247 case, there has been an active dialogue between the UK and the partners from each country in
248 South East Asia, but almost no interaction between Vietnam, Malaysia and Indonesia. For the main
249 purpose of mutual capacity building, which should involve networking between all participants and
250 learning from others' best practice, participant-to-participant interaction is indispensable. Actively
251 encouraging participant groups to communicate with each other during designated tasks could
252 overcome this challenge.

253 Considering the disadvantages, the delivery of virtual capacity building may not be appropriate for
254 all training contents which still require direct physical interactions like for example complex field
255 work activities or the handling of tools. When there is choice, the advantages and disadvantages of
256 virtual and ordinary capacity building need to be carefully considered before making the decision to
257 travel or not.

258 Key Takeaway Messages

259 We need to question our existing practices and norms when it comes to global collaboration for
260 capacity building and create new, innovative measures and strategies. Based on our three-day
261 experience of virtual capacity building we have identified several key lessons that can apply for
262 similarly structured activities.

263 Firstly, it is important to keep the dialogue active despite the obvious convenience of a one-way
264 communication. An interactive dialogue is the key to the co-creation of project plans and enables us
265 to go beyond one-way training and towards mutual capacity building.

266 Along the same lines, the workshop preparation should involve backup plans, allowing for the
267 unexpected to happen. This flexibility is best realised through active communication between all
268 partners, continuous co-creation and meticulous workshop development.

269 Thirdly, we need to make it clear to ourselves what the potential advantages and disadvantages of
270 holding a virtual capacity building workshop are, prior to the process itself. This is to acknowledge
271 the limitations inherent in the approach, which may call adoptions of specific structural,
272 technological and behavioural adaptations.

273 Despite its non-physical nature, we feel that our virtual workshop did reduce the geographical
274 difference amongst us. Not only by co-delivering our workshop but also by jointly rethinking our
275 lessons learned for this article made us appreciate the togetherness of us as disparate workshop
276 members striving to achieve a common aim despite the current challenges.

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