CRUISE REPORT

PARTICIPATION

Advancing visitors' participation in citizen science: the new appeal for the Arctic?

Le Commandant Charcot, Cruise No. CC110823,

11/08/2023 – 26/08/2023, Longyearbyen, Svalbard (Norway) – Longyearbyen, Svalbard (Norway)

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Summary

The PARTICIPATION project was conducted onboard *Le Commandant Charcot* from Longyearbyen to the North Pole and back to Longyearbyen from 11 August to 26 August 2023. The main goal of this ship-time research was to investigate the potential of citizen science in the context of an Arctic expedition cruise. A mixed-method approach was used to conduct the research. Scientific data was collected from two surveys with passengers, from semi-structured interviews with passengers, members of the expedition team and some of the onboard scientists, and from participant observation. It is expected that investigating passengers' interests in citizen science will lead to a better understanding of where to locate and explore consumers' demand, motivations and experiences. This could constitute a valuable resource for cruise operators in terms of future marketing strategies, and perhaps more importantly, for future collaborations between the tourism industry and the scientific community.

Even though the data collection exceeded our expectations, especially regarding the number of informants we were able to interview (based on our research proposal), we still need to collect more data from passengers of Arctic and Antarctica expedition cruises to draw reliable conclusions.

The research was conducted by a team of two geographers from the University of Oulu, Finland, with expertise on Arctic environment-human relationships and Arctic tourism.

1. Research Programme/Objectives

This ship-time research onboard *Le Commandant Charcot* focused on citizen science in expedition cruising and investigated how citizen science could contribute to research on Arctic environmental and sociocultural issues (for example, shrinking sea ice, biodiversity loss, associated cultural erosion etc.). The research was conducted as part of the Arctic Interactions (ArcI) programme of the University of Oulu (Finland). ArcI is an interdisciplinary research programme developed by the University of Oulu and co-funded by the Research Council of Finland (formerly Academy of Finland). It explores global change and northern environments, human-environmental relationships, and sustainable systems, resource use and development in the Arctic. One of the ArcI's research topics covers the intricate interactions between the growing tourism industry and the rapidly changing Arctic environment, by identifying key cultural conceptions, values and practices that are focal for actors of the tourism industry, but also for local communities and environments. Indeed, the various effects of climate change are leading to severe physical and ecological changes in Arctic seas, which are not only of concern for the research community but also for the cruise tourism industry that is dependent on these unique marine ecosystems (Lück, Maher & Stewart, 2010; Palma et al., 2019).

This ship-time research is only a part of a wider research project whose overarching research question is to understand how Arctic tourism can advance science. As we are in the middle of preparing funding applications to pursue the project, we will not give any details of the wider research project in this public document. Instead, this report will only focus on the objectives of the ship-time research conducted onboard *Le Commandant Charcot*.

The ship-time research investigates people's motivations to visit the most remote parts of the Arctic and aims to situate and assess citizen science in the span of travel motivations. Citizen science is characterized by public participation in scientific research, particularly in data collection. It is a research method that has been well-established in natural sciences (Taylor et al., 2020; Jørgensen and Jørgensen, 2021; Hardy et al., 2022). At

the time of the ARICE-Ponant call Arctic 2023, citizen science activities were advertised on Ponant' website, but were removed several months later. Therefore, we had to slightly adapt our study to fit the new configuration onboard. Nevertheless, the lack of citizen science activities onboard did not hinder our study too much. It is worth noticing that some "citizen science activities", as mentioned in the daily programme, were still offered to passengers during the cruise.

The main goal of this ship-time research was to start investigating the potential of citizen science in the context of an Arctic expedition cruise through three objectives:

1. to understand the relationships of tourists/passengers with science, through their interactions with onboard scientists and their participation to proposed science-related activities by the expedition team;
2. to explore the possibilities of implementing citizen science activities onboard in the context of onboard scientific projects (here we are not only talking about applications such as Happy Whale or eBirds but about engaging passengers to the work of the onboard scientists);
3. to investigate the potential changes in tourists' intentions towards science after experiencing and learning about the fragile Arctic environment while onboard.

In line with the latter objective, the cruise to the North Pole was meaningful for several reasons. The North Pole epitomizes the quintessence of popular and collective imaginaries of the Arctic, with elements such as sea ice, polar bears and white vistas being key elements of the tourist experience in the High Arctic (Saarinen & Varnajot, 2019). These vanishing key elements, particularly the sea ice and its negative impacts on polar bears habitats, have become infamous symbols of climate change. Thus, it is assumed that experiencing, observing and learning about the sea ice might have a greater impact on passengers' awareness in respect to climate change consequences and willingness to engage in citizen science initiatives in the future.

2. Narrative of the Cruise

Being onboard *Le Commandant Charcot* to conduct geographical scientific work offered a undoubtedly unique and extraordinary fieldwork which brought a lot of new quantitative and qualitative data for science.

The research activities conducted onboard (see Table 1) consisted of (1) running two surveys among passengers, one at the beginning of the cruise, and another one towards the end of the cruise, (2) semi-structured interviews with passengers, members of the expedition team and members of the science team, and (3) participant observation during lectures, so-called citizen science activities, and outdoor activities.

Conducting ethnographic-related work requires adaptability and flexibility from the researchers' side. Soon after boarding, we faced the first challenges and realised we will have to be instantly responsive to many different situations. For instance, while our research material was available in French and in English (as agreed with PONANT scientific coordinator), approximatly one third of the passengers only spoke Chinese and another part only Russian. We had to quickly cope with it and get the translations done as soon as possible. Also, even though we offered the possibility to our informants to answer the survey questions on the tablets, a majority of them preferred to use a paper version. We had to rework our surveys to fit the prerequisites of a paper version. As expected, we alsohad to adapt our research activity plan to fit the changing daily programme offered by the expedition team to the passengers, so we would have been able to target best and appropriate times to look for respondents. For example, most of the semi-structured interviews were therefore conducted during the navigation days when there were no outdoor activities for the passengers. Finally we carried out participant observation during the lectures given by the guides and the so-called citizen science activities to

gain knowledge and deeper understanding of the interactions between the different actors. This research method was complemented by informal discussions, field notes and writing up data sessions.

Even though our aim was to use data triangulation to collect qualitative data, sometimes we had to collect data apart since two research activities could occurr at the same time. Nevertheless, it is worth noticing that all the semi-structured interviews were conducted together for the data triangulation purposes.

Table 1 – Daily research activities onboard Le Commandant Charcot, 11-26 August 2023

Date	**Research activities**	**More information**
11 August	Other	Embarking, lifeboat drill Meeting up with the science team
12 August	Survey 1	• finalizing the fieldwork settings onsite (selection of survey places, passengers' info, passengers' activity programme) • finding translators of our surveys in Chinese and Russian
13 August	Survey 1 Participant observation Science communication	• Launch of the survey in French and English in common spaces, use of tablets • Advertising the survey on screens and daily programme • lecture "Le monde de la banquise" • lecture "Life in the Arctic Ocean: blueprints of a miracle" Introduction of our scientific project to the passengers at the Science session with the science team
14 August	Survey 1 Participant observation	• preparation of paper version • running the survey in common spaces • working on Chinese and Russian version with translators • lecture given by researchers from the Polarstern • so-called "citizen science" activity organised for passengers • wet and dry lab visits in English for passengers
15 August	Survey 1 Participant observation	• running of the survey in common spaces • launch of the Chinese and Russian versions • at first ice landing (especially interactions with our colleagues, glaciologists and oceanographers) • wet and dry lab visits in French for passengers • lecture: "L'Arctique et le climat"
16 August	Survey 1 Participant observation Interviews	Running and closing of survey 1 On sea ice, including so-called "citizen science" activity (as mentioned in the daily programme) On sea ice with passengers

17 August	Survey 1 Participant observation	Input of survey data into the RedCap programme On sea ice, including so-called “citizen science” activity (as mentioned in the daily programme)
18 August	Survey 1 Semi-structured interviews	Input of survey data into the RedCap programme 11 informants
19 August	Semi-structured interviews	11 informants
20 August	Semi-structured interviews Survey 2	3 informants • modifying the content of the survey based on the results of Survey 1 • working on the translations in Chinese and Russian • preparation of the paper version
21 August	Participant observation Semi-structed interviews Survey 2	During the landing at Texas Bar 4 informants • launch of the survey in French and in English in the common spaces • working on Chinese and Russian version with translators
22 August	Participant observation Survey 2	During the landing at Bruceneset • running of the survey in common spaces • preparation of the paper version in Chinese and Russian
23 August	Survey 2 Participant observation Semi-structured interviews	Running of the survey in common spaces During the landing at Magdalena Bay 3 informants
24 August	Participant observation Survey 2 Semi-structured interviews	At Ny-Ålesund Running the survey in common spaces 3 informants
25 August	Participant observation Survey 2 Science communication	During the landing at Poolepynten Running and closing of survey 2 Presentation of the results of our fieldwork to the passengers
26 August	Other	Disembarking

3. Station List

Our work did not require any specific stations. We made use of the station work time of the other scientists onboard to perform participant observation and short interviews with passengers on sea ice, at the first ice landing and at the North Pole.

4. Preliminary Results

Based on the fieldwork conducted onboard *Le Commandant Charcot*, we collected 82 responses for Survey 1 and 75 responses for Survey 2, and we conducted semi-structured interviews with 34 informants. The data analysis will start in October and will be running through the autumn and winter as planned in the research proposal. We expect to publish 3 to 4 papers in open access peer-reviewed scientific journals and to disseminate our results in conferences in the spring, especially at the Arctic Congress held in Bodø in June 2024.

Even though the data collection exceeded our expectations, especially regarding the number of informants we were able to interview (based on our research proposal), we still need to collect more data from passengers of Arctic and Antarctica expedition cruises to draw reliable conclusions.

It is also worth mentioning here that during our research time onboard *Le Commandant Charcot*, we found out that the term “citizen science” is not understood and used similarly by the scientific community than by the tourism industry. While, us, researchers, think of citizen sicence as a research tool and method to predominantly collect data to be scientifically used and analysed, many tourism stakeholders think of citizen science has a fun, interactive and educative activity for tourists.

5. Data and Sample Storage / Availability

Ethnographic and participant observation of subjects, as well as data issued from informal discussions were recorded in the form of hand-written field notes, which will then be transcribed to electronic format and backed up. Semi-structured interviews were recorded with hand-held digital voice recorders in the form of audio recordings, following the EU General Data Protection Regulation (GDPR) guidelines and with the signed consent of informants to be audio-recorded. Quantitative surveys were carried out either on paper or on the tablet by using the RedCap programme. The results were recorded in the form of digital, flat-file databases.

The collected data is for the moment confidential for ethical purposes. During data analysis, the data will be accessible only by certified members of the research group. When processing the data for analysis, both researchers will remove all identifiers from the interview transcripts for anonymity before the deposit to the Finnish Social Science Data Archive. Hard copies of data from fieldwork are stored in a secure location in the PI's office and backed up on the university's network storage disk. Metadata of project data will be published in Etsin Research Data Finder.

6. Participants

No.	Name	Early career (Y/N)	Gender	Affiliation	On-board tasks
1	Élise Lépy		F	University of Oulu	PI, coordination role Surveys, Interviews, Participant observation
2	Alix Varnajot		M	University of Oulu	Surveys, Interviews, Participant observation

7. Acknowledgements

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