

Opportunities and Challenges for the Next Generation of Cartographers

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Developing the next generation of cartographers is essential to sustaining and expanding the mission of the International Cartographic Association. Students and early-career professionals today learn cartographic design alongside a diverse array of conceptual and technical competencies, such as data science, human-computer interaction, information visualization, and machine learning. Accordingly, the next generation of cartographers often are working at the forefront of the discipline, actively reshaping what cartography is and can be.

In this abstract, we present the results of a workshop designed to identify opportunities and challenges for the next generation of cartographers. The workshop was held on September 20th as part of the EuroCarto 2022 conference in Vienna and was inspired by pre-pandemic initiatives in 2014–2017 by the German Society for Cartography (DGfK) to support early-career scientists and professionals entering the discipline. Our goal with the workshop was to create a safe space for the next generation of cartographers to discuss unmet needs for their research and design training as well as reflect upon institutional and professional barriers they are facing as they enter the workforce. Overall, five organizers and 24 peers participated in the workshop that stretched nearly three hours, with most participants coming from Europe and North America.

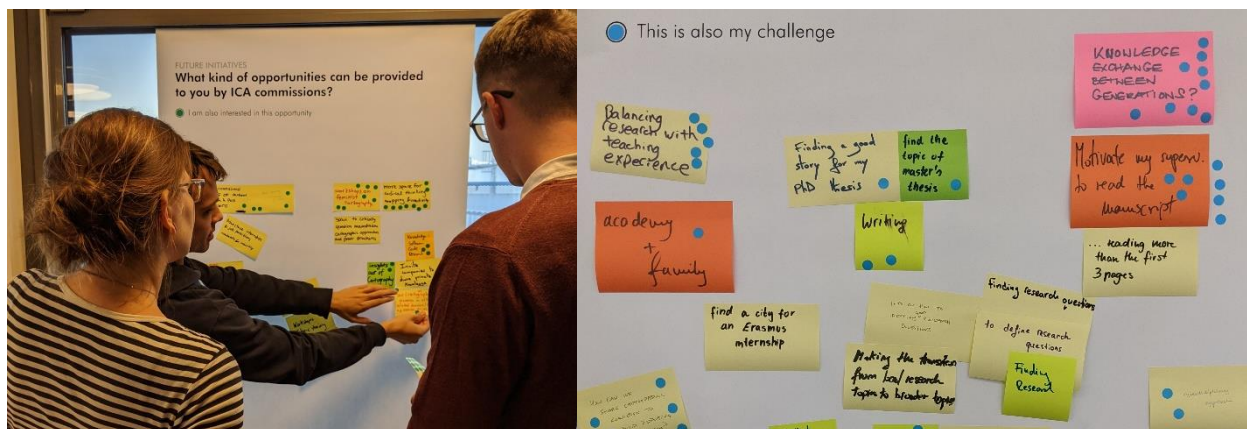


Figure 1. Left: workshop participants in discussion in front of the “ICA opportunities” poster. Right: detail of the “academic challenges” poster, with cards containing participants’ suggestions and voting dots.

We structured the workshop in three phases. In the first phase, a subset of participants gave short presentations on preliminary research, with pairs of related presentations followed by a short group discussion. We asked presenters to emphasize the challenges they have encountered when starting their research. These inspirational presentations were intended to help other participants brainstorm additional opportunities and challenges from their own experiences, which they recorded on post-it cards. In the second phase, participants attached their cards to one of three posters with different overall themes: (1) academic challenges, (2) professional challenges, and (3) engagements for the ICA and its commissions (see Figure 1). Participants were able to add new cards as they reviewed each other’s comments and also received three sticky dots for each category to mark cards with which they identify (see Figure 1, “This is also my challenge”). In the final phase, we clustered and summarized the card suggestions as a starting point to invite broader group discussion about opportunities and challenges for the next generation of cartographers.

After the workshop, we analyzed the card content in more detail using thematic analysis and card sorting procedures (Tomitsch et al. 2021). We first transcribed the card suggestions on each poster into a spreadsheet, including the number of votes on each card. We then assigned keywords in an iterative coding process, with two coders independently identifying keywords for the card content and then jointly discussing the initial coding to reach agreement on keyword phrasing. This process organized synonyms and overlapping suggestions into consistent keyword codes, condensing suggestions representing different aspects of the same opportunity or challenge while preserving the broader scope of participant suggestions. We also tracked the total number of votes for each keyword code (see Appendix). Finally, we sorted the keyword codes into a two-dimensional digital drawing board to visually cluster overlapping, higher-level themes. Figure 2 shows the results of this clustering for the “Academic challenges” poster.



Figure 2. Clustered keywords, derived from the content analysis of participants’ cards for the “academic challenges” question. Themes (pink cards) show the number of total votes received from the cards assigned to the theme.

The cluster analysis revealed some interesting insights into the suggestions from workshop participants. In the “academic challenges” category, participants emphasized opportunities for inter-generational and peer-to-peer sharing of knowledge and experience as well as the challenges of finding resources (e.g., code, data, literature, and research topics) and achieving work-life balance in an academic environment. In the “professional challenges” category, participants identified the difficulty of continuously learning evolving technologies as well as the anxiety associated with career planning and job seeking. Finally, participants stressed professional development and networking events, online forms of knowledge exchange, and a stronger presence of critical and feminist approaches as key “engagements for the ICA and its commissions”.

The workshop results represent a call to action for the ICA and its commissions. We first want to see extension of our workshop approach to next generation cartographers on other continents, particularly participation from the Global South. We also wish to see a dedicated effort to support professional development and networking for early-career cartographers in addition to the ICA’s existing emphasis on academic research and development of national mapping agencies. Asking ICA commissions to include professional development events as part of their terms of reference is one strategy to ensure these efforts continue. Finally, we encourage the ICA to consider how it can better seek and utilize input from the next generation of cartographers, such as a standing committee comprising early-career cartographers or direct representation on the Executive Committee.

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Appendix

Academic Challenges		Professional Challenges		ICA Opportunities	
<i>Votes</i>	<i>Keyword</i>	<i>Votes</i>	<i>Keyword</i>	<i>Votes</i>	<i>Keyword</i>
10	Exchanging generational knowledge	22	Planning career	25	Facilitating event organization
8	Establishing supervisor/supervisee routine	13	Developing technological skills	19	Supporting critical approaches
8	Finding research	13	Undergoing technical training	18	Networking beyond immediate surrounding
8	Finding research topics	9	Conducting interdisciplinary research	12	Networking internationally
7	Sharing knowledge	9	Balancing job/value alignment	12	Creating an early-career lobbying group
7	Balancing paid/unpaid work	9	Sharing knowledge	11	Exchanging generational knowledge
7	Publishing research	8	Learning continuously	11	Establishing mentorship
7	Discussing / negotiating salary	7	Conducting applied research	10	Improving creativity
6	Formulating research questions	7	Managing job uncertainty	9	Developing body of knowledge & bibliography
6	Gathering experience	7	Keeping teaching materials up-to date	8	Supporting feminism approaches
6	Establishing research self-discipline			8	Conducting interdisciplinary research
6	Balancing research/teaching workload			6	Undergoing technical training