Supporting Workers in Developing Effective Collaboration Skills for Complex Work

Evey Huang
Kapil Garg
eveyhuang@u.northwestern.edu
kgarg@u.northwestern.edu
Northwestern University
Evanston, IL, USA

Diego Gómez-Zará
dgomezara@nd.edu
Notre Dame University
Notre Dame, IN, USA

Julie Hui
juliehui@umich.edu
University of Michigan
Ann Arbor, MI, USA

Chinmay Kulkarni
chinmay.kulkarni@emory.edu
Emory University
Atlanta, GA, USA

Michael Massimi
mmassimi@slack-corp.com
Slack
San Francisco, CA, USA

Elizabeth Churchill
elizabeth@elizabethchurchill.com
Google
Mountain View, CA, USA

Elizabeth Gerber
egerber@northwestern.edu
Northwestern University
Evanston, IL, USA

ABSTRACT

This workshop aims to support participants in reflecting, ideating, and prototyping new socio-technical approaches to help workers develop effective collaboration skills for complex work. While CSCW researchers have created tools to provide workers access to collaboration opportunities, workers require more support in learning how to collaborate effectively to benefit from these opportunities. We invite academic and industry researchers who study these topics and develop socio-technical systems for workplaces to participate in this workshop. Participants will share insights from their work and work with each other to envision an agenda for future research and design of workplaces that support learning how to collaborate. Discussion and ideas generated from this workshop will be synthesized and archived online for the larger research community and the general public. We hope these discussions will foster new collaborations and further develop a community of researchers who have supporting learning as an agenda for the future of work.

ACM Reference Format:
Evey Huang, Kapil Garg, Diego Gómez-Zará, Julie Hui, Chinmay Kulkarni, Michael Massimi, Elizabeth Churchill, and Elizabeth Gerber. 2023. Supporting Workers in Developing Effective Collaboration Skills for Complex Work. In *Proceedings of Computer Supported Cooperative Work (CSCW 2023).* ACM, New York, NY, USA, 4 pages. https://doi.org/XXXXXXX.XXXXXXX

CSCW 2023, October 14–18, 2023, Minneapolis, MN, USA

ACM ISBN 978-x-xxxx-xxxx-x/YY/MM…$15.00
https://doi.org/XXXXXXX.XXXXXXX

1 INTRODUCTION

Complex work like design and engineering [10, 33] involves solving ill-defined problems [20, 30] that have conflicting goals from multiple stakeholders [21], requires coordinating interdependent systems [28], and occurs in rapidly changing environments [14]. From research programs to product, service, and infrastructure design projects, effective cross-functional and cross-organizational collaboration is central to the success of complex work. Workers need to align on goals and preferred outcomes, assess risks, and navigate value systems while supporting effective communication across different skill sets and domains of expertise. Effective collaboration requires workers to develop strategies for providing and accessing workplace support [11]. This includes developing supportive relationships with peers and mentors [6, 17, 23], identifying and exchanging resources [15, 16], communicating what support is needed [15, 17, 18], and reflecting on how one's work practices can be improved [25]. In short, a team's success (and the organization, broadly) is determined by how well workers develop skills to collaborate with others during their work processes.

Despite this need, CSCW and industry have spent significant effort developing socio-technical solutions promoting access to collaboration opportunities [24] but relatively less effort towards how workplaces can support workers in *learning to collaborate effectively.* For example, productivity tools help workers track work progress and obstacles [1–3] and find collaborators [4, 5, 13, 18, 27] but provide limited support on how to orchestrate the collaboration interactions. Instead, they assume that workers already have effective communication skills for framing support requests and social capital with other workers [19] necessary for soliciting support. Likewise, more networked structures [29, 32] and Agile work technologies [9, 35] may promote collaboration from different parts of the workplace but assume workers know how to use these collaboration opportunities to progress their work and reflect on how to improve their work practices [11].

More broadly, workplaces have focused on how workers can be more productive without understanding and supporting the development of skills that drive effective, long-term productivity [34]. Workplaces often focus on optimizing local, project-specific productivity for realizing short-term work outcomes (e.g., a completed presentation; a user test for new software). However, it is ultimately through fostering long-term skill learning for workers–not just short-term productivity–that leads organizations to grow their capacity for complex work, realize productivity outcomes, and become more resilient to worldwide economic disruptions in the long run [26]. As workplaces increasingly tackle complex work that requires workers to collaborate, CSCW should prioritize understanding and developing novel socio-technical approaches to support workers in learning the necessary skills to collaborate effectively.

In this workshop, we ask: *How might CSCW researchers create new socio-technical systems to better support workers in learning how to collaborate effectively to accomplish complex work?* We aim to answer this question by bringing together a diverse range of researchers to discuss promising directions for the importance of on-the-job learning and develop a better social-technical understanding of how to support learning effective collaboration skills beyond providing access to collaboration opportunities.

Crucially, this workshop occurs at a significant turning point in our technological development. As computing technologies advance, it is critical for CSCW as a field to consider how workplaces can use these technologies to serve workers developing the skills to be effective in their work rather than reductively focusing on how to optimize worker productivity above all else. This workshop will help inform a future research agenda for CSCW in designing future socio-technical workplace configurations and technology amenable to learning the critical skills for being effective in complex work.

1.1 Guiding Questions

(1) What are examples of organizations or projects that failed due to poor collaboration within organizations or between team members?
(2) What are the challenges in learning to collaborate effectively?
(3) What sub-skills under collaboration should we support in the workplace to support more effective collaborations for complex work?
(4) What needs to change about our ways of working in workplaces (i.e., organizational work processes, social structures, collaboration venues, and productivity tools) to be more amenable to learning collaboration skills?
(5) What are the responsibilities of learning communities to teach collaboration skills? Can these communities provide authentic learning environments for these skills?
(6) How might different work modalities (e.g., hybrid and remote) and work types (e.g., ad-hoc organizations; gig workers) affect how learning collaboration skills is supported?
(7) What is the role of AI tools, particularly generative AI, in helping workers develop better collaboration practices?

1.2 Workshop Goals

The goals of this workshop are as follows:

- **Reflect** on the current ways of working in organizations and understand how they support or hinder the process of learning collaboration skills in the workplace.
- **Ideate** what socio-technical models–including work processes, social structures, and technology–that prioritize workers developing effective collaboration skills might look like.
- **Prototype** concrete takeaways and designs that the participants and broader CSCW community can start to implement to support learning effective collaboration skills in the future of work.
- **Share** how the ideas discussed in the workshop may be considered and implemented in real workplaces, and potential barriers to their adoption.

We plan to report on the outcomes of this workshop in the form of an ACM Communications article and a corresponding blog post.

2 WORKSHOP LOGISTICS

We will host a 1-day, in-person workshop from 9:00 a.m. - 5:00 p.m. We will invite 15-20 researchers from academia, government, and industry who represent research in CSCW, management and organization science, network science, learning science, and computer science. We will recruit participants via a public website and postings on social media and relevant listservs. Participants will submit a 3-5 page (excluding references) position paper describing how their work examines or influences how workers learn to collaborate in workplaces or how their work could benefit from such perspectives. The organizers will choose participants based on the relevance of their work to the workshop topic and the diversity of perspectives they represent. The workshop will require large Post-it pads, blank printer paper, small Post-its, markers, and a projector. Due to the planned prototyping activities, our workshop will require in-person attendance.

3 TENTATIVE AGENDA

- 9:00 a.m. - 10:00 a.m.: Introductions and short talks
- 10:00 a.m. - 10:15 a.m.: Coffee break
- 10:15 a.m. - 11:00 a.m.: Activity 1: Team reflection on current practices
- 11:00 a.m. - 12:00 p.m.: Activity 2: Ideate and Activity 3: Prototype
- 12:00 p.m. - 1:30 p.m.: Lunch
- 1:30 p.m. - 2:30 p.m.: Activity 3: Prototype (continued)
- 2:30 p.m. - 2:45 p.m.: Coffee break
- 2:45 p.m. - 4:00 p.m.: Prototype share out
- 4:00 p.m. - 4:45 p.m.: Activity 4: Sharing and Reflection Panel
- 4:45 p.m. - 5:00 p.m.: Synthesis + Closing

4 WORKSHOP ACTIVITIES

This highly interactive workshop will involve presentations, discussions, and design activities. At the start of the workshop, organizers will give short talks (5 minutes) to show examples of their work and perspectives on how workplaces can adapt their ways of working to support learning effective collaboration skills; they will also share what they are excited to discuss in the workshop. In addition, workshop attendees will give a short, 2-3 minute summary of their position paper and their interests and goals of the workshop.

Following introductions, we will split participants into groups based on the themes of their perspectives. Each group will participate in three activities to reflect on, ideate, and prototype new socio-technical approaches that workplaces can adopt to support workers in learning to collaborate. Finally, we will do a reflection panel with all organizers and attendees to discuss ideas generated throughout the workshop. We detail these activities below.

4.1 Activity 1: Team Reflection on Current Practices

Participants will break into groups of 3-4 and work with 1-2 workshop organizers. They will reflect on how organizations currently support workers in collaborating with each other and obstacles for why these need to be improved for learning how to collaborate effectively. Some questions to guide the reflection include:

- What are the current challenges in learning effective collaboration practices?
- What have CSCW and adjacent research areas done to support collaboration practices and learning collaboration skills?
- How can workplace support or hinder learning to collaborate?
- What might it look like to change how we work to be more amenable to skill learning in the workplace?

4.2 Activity 2: Ideate

In the same groups, participants will ideate on new socio-technical systems for workplaces that may resolve some of the challenges raised in Activity 1. We will encourage participants to be explicit about the type of organizations (e.g., small and large, for-profit or non-profit, etc.), class of workers (e.g., workers in established workplaces versus gig workers or independent contractors), and the modality of work (e.g., in-person, remote, or hybrid) they are interested in. The goals of this ideation activity include identifying specific collaboration learning goals that each group wishes to foster, challenges in supporting that learning goal in the workplace, and potential designs for new organizational structures, processes, and/or tools to resolve the obstacles.

4.3 Activity 3: Prototype

Participants will perform a deep dive into one idea. Conceptually, we will instruct participants to develop their design arguments for their idea and discuss what implementing the idea may look like. Practically, we will have them design new organizational structures, work processes, and/or tools that realize their idea.

4.4 Activity 4: Sharing and Reflection Panel

We will invite the organizers to join a panel to discuss the prototypes and engage in a conversation to understand the possible barriers to implementation in a real workplace. For instance, we will discuss how workplaces may shift their existing productivity-first practices towards considering worker skill learning alongside day-to-day work activities. In addition, we will discuss what kinds of conversation we want to foster about learning how to collaborate (and, more broadly, skill learning) in our workplaces.

5 WORKSHOP ORGANIZERS

The workshop organizers are:

- **Evey Huang** is a Ph.D. student in the Technology and Social Behavior (TSB) program, a joint program between computer science and communication studies, at Northwestern University. She studies and designs mixed-initiative human-AI systems to support learners in solving real-world, ill-defined problems [15]. She considers how AI technologies might collaborate with human coaches to monitor learners' progress, diagnose potential risks and obstacles, and provide learners with regular, dedicated support.
- **Kapil Garg** is a Ph.D. student in the Technology and Social Behavior (TSB) program, a joint program between computer science and communication studies, at Northwestern University. His work develops and studies networked orchestration technologies to support knowledge workers engaging in situated work activities within socio-technical work and learning environments. He considers how these systems can help workers monitor for opportunities to collaborate and strategize how these opportunities can progress their work or learning goals [11, 12].
- **Diego Gómez-Zará** is an Assistant Professor at the Department of Computer Science and Engineering and the Mendoza College Business (by courtesy) at the University of Notre Dame. His research focuses on how social computational systems help people organize and collaborate. His work has been at the forefront of computational social science, human-computer interaction, and network science.
- **Julie Hui** is an Assistant Professor at the University of Michigan School of Information. She investigates how technology influences access to work and employment. Specifically, she studies how digital technologies facilitate help-seeking, agency, and social support in informal work contexts, such as among gig workers and under-resourced small business owners.
- **Chinmay Kulkarni** is an Associate Professor of Human-Computer Interaction at Emory University, where he directs the Expertise@Scale lab. His work is at the intersection of large data and automation, learning, and the future of work. In his research, he investigates how the new affordances of scale and automation can create new opportunities for people to learn and work more effectively. His research introduces novel computer systems that demonstrate benefits at a large scale that is otherwise not achievable. His recent work has focused on creating systematic opportunities for building empathy in remote organizations [22], helping participants re-imagine their collaborative roles through collective reflection and co-design [7], and how AI might result in new kinds of work [31] (and art [8]).
- **Michael Massimi** is a Senior Principal Researcher at Slack where he manages academic partnerships. His research focuses on how knowledge workers communicate and collaborate. Prior to Slack, he worked on Facebook Groups and at Microsoft Research. He completed his Ph.D. in Computer Science from the University of Toronto.

- **Elizabeth Churchill** is a Senior Director of UX at Google and Co-Chair of Google's UX Leadership Council. She has built research teams at Google, eBay, Yahoo, PARC, and FujiXerox. Her current focus is on the design of effective designer and developer tooling for a new operating system, Fuchsia.
- **Elizabeth Gerber** is a Professor at Northwestern University, the Co-Director and Founder of Northwestern's Center for Human-Computer Interaction + Design, and Faculty Founder of Design for America. She helps organizations design and implement new technologies to collaborate effectively.

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