

A Rapid, Iterative, and Remote (RIR) Method for Designing Translational Tools: Study Experience and Lessons Learned

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ABSTRACT

We present a rapid, iterative, and remote (RIR) approach as a collaborative method for combining designers' feedback in creating translational tools by HCI researchers to make academic knowledge accessible to designers. RIR allows refining and validating the design of translational tools through exhaustive rapid iterations on several versions of tools. To demonstrate RIR, we present a study of translational design cards in the context of societal resilience with 14 participants. In the paper, we share our study experience, challenges, and lessons learned in conducting the RIR method. Reflecting on our experience, we provide recommendations on various aspects of the method, such as onboarding, activity design, card interactions, schedule management, data collection and analysis, and decision-making processes. We hope our study experience and recommendations open doors for researchers to use the RIR method for designing translational tools for diverse design spaces.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in HCI**.

KEYWORDS

Design method, translational tool, design cards, lessons learned

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1 INTRODUCTION

Research in Human-Computer Interaction (HCI) often provides design implications, guidelines, and frameworks that translate research findings into actionable recommendations for designers to

adopt during their design practices and facilitate collaboration between research and practice. Despite these efforts, designers often find academic research content too abstract, complex, jargon-laden, inaccessible, difficult to use, and not detailed enough to prompt the appropriation of research findings into their workflow in industries [1, 4, 13]. As a result, the extent to which designers and researchers benefit from each other's skills and knowledge is limited. Therefore, many HCI researchers have strived to create translational tools, such as design cards [3, 8], personas, scenarios, cultural probes [7], toolkits [9], blogs, etc., to communicate their work to designers.

To ensure better use of translational tools by designers during the design process, these design tools should be developed in collaboration with designers while reflecting designers' perspectives [1, 10]. However, due to time and resource constraints, it is not always possible to involve designers in the end-to-end design cycle of translational tools. To overcome this challenge, HCI researchers often create translational tools through discussions and iterations within the research team and evaluate them with designers using methods such as interviews, workshops, etc. [3, 5, 10, 12]. A complete user study on one version of the design tool requires researchers to invest more time and effort to produce a mature version before that can be used for testing. However, researchers are often not incentivized to create translational tools [1]. They have a lot of different other priorities (e.g., working on their research, graduating, getting tenure, etc.), which limits them from investing their time and effort to create translational tools. Therefore, low-cost methodologies that can produce extensive and adequate feedback from designers within the shortest possible time and ensure rapid evaluation on earlier versions of the translational tool can be beneficial for researchers in the development process of design tools. Toward that goal, we propose a rapid, iterative, and remote (RIR) method that can be used by researchers for designing translational tools to facilitate collaboration between academic knowledge and design practice.

We present RIR as a collaborative method for combining designers' feedback and reflection in the creation of translational design tools with HCI researchers. In the RIR method (Fig. 2), researchers perform iterations on the translational tool after each one-on-one study session with a designer based on their responses and feedback. Researchers then use the most recent version of the tool with the next designer to verify the effectiveness of the changes made to the tools. The process is repeated until new responses and feedback

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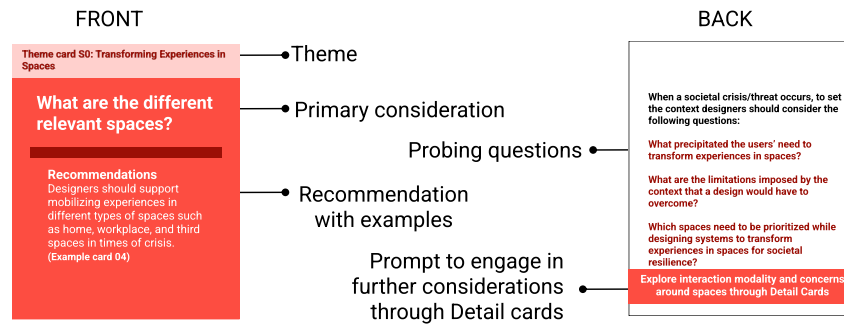


Figure 1: An overview of our initial design of translational card deck which illustrates card content on the front and the back

do not trigger major changes in the design of the translational tool. Although the method involves making changes based on a small amount of data (e.g., one designer’s feedback), it allows rapid assessment of the effectiveness of those changes with enough designers. Also, since not all feedback can clearly indicate a need for a change or quick fixes in the tool, if researchers are not certain about a potential change, they could wait to see if other designers provide similar feedback before making the change.

While the iterative nature of the RIR method resembles to the traditional iterative design process¹, the RIR method is not a substitute for the design process. The RIR method is a sub-part of the iterative design process, which focuses on designing and evaluating the use of translational design tools. Other usability testing methods, such as the rapid iterative testing and evaluation (RITE) method [11], exist to allow designers to make quick changes to the user interface of commercial products as well as test the effectiveness of those changes. Despite the similarities with the RITE method, the RIR method is a remote-first approach for creating translational tools (e.g., design cards) in research settings. The remote-first approach of RIR is significant for translational tools as recruiting practitioners or expert designers to participate in the creation process of design tools is extremely difficult, and often the incentives provided for such are insufficient. Hence the remote method will facilitate recruiting practitioners with diverse design experiences.

To demonstrate the RIR method, we present a study of a translational tool (i.e., societal resilience design cards) with 14 participants. In this paper, we focus on reporting researcher’s perspectives on the process of conducting the RIR method. Reporting the study findings and changes made to the translational tool are not the focus of this paper. Our main contributions are: (1) a detailed description of the RIR method, and (2) a discussion of our reflections and lessons learned from this approach. We make recommendations based on our experience to inform HCI researchers adopting a similar method while partnering with designers for making academic knowledge accessible to designers.

2 THE RIR METHOD

We conducted a study adopting the RIR method to create a translational tool, i.e., design cards, for societal resilience. The translational tool’s goal is to bridge the gap between applied research and design practice while translating the research knowledge into usable

resources for adoption in practice [2]. Based on prior literature on social support and adaptations in times of crisis, we created an early version of the design card deck (Fig. 1). The card deck consists of 16 cards divided into three themes, which allow a designer to explore design opportunities to build and enhance society’s resilience from different aspects: (1) social support, (2) activities, and (3) spaces. The purpose of the RIR method was to solicit feedback on the design card content, visual designs, and card uses and make iterations on the cards accordingly. The iterative method allowed us to test the effectiveness of changes made based on feedback.

The university institutional review board (IRB) approved the protocol. We had a total of 14 participants who were student designers from master’s-level HCI design programs. Their ages ranged between 23 and 31 with an average age of 27 years old. Most participants (N=11, 78.57%) had different levels of industry experience working as user experience (UX) designers. Seven participants had one or more years of industry experience, while four had less than one year. Half of the participants had prior experiences in designing solutions for crisis and societal resilience. Among the participants, seven had used different types of card decks (e.g., IDEO, Tarot Cards Of Tech, and UX design kit) for a design project. Although we anticipated that having prior experiences with design cards and designing products/services related to societal resilience may impact participants’ feedback on the design and use of the translational design cards, we did not encounter significant differences based on participants’ experiences while adopting the RIR method.

2.1 Procedure

The RIR method involves three phases (Fig. 2): 1) onboarding, 2) design feedback, and 3) card iteration. At the end of the study, each participant was compensated with a \$30 Amazon electronic gift card for their time.

Phase 1: Onboarding. We conducted a one-on-one onboarding session over Zoom. The goal was to familiarize participants with the study procedure and share a link to a private Miro board² with each participant that contained the instructions for study activities and the most recent version of the design cards. We scheduled the onboarding sessions a couple of days before Phase 2, to give the participants enough time to become familiar with the design cards.

¹<https://www.smartsheet.com/iterative-process-guide>

²<https://www.miro.com/>

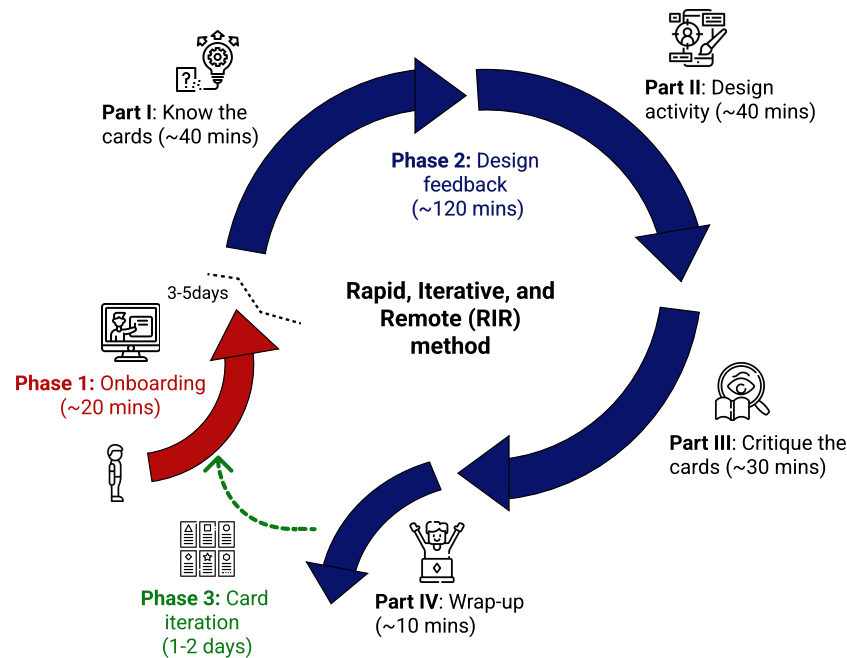


Figure 2: An overview of the Rapid, Iterative, and Remote (RIR) method. The method involves three phases: onboarding, design feedback, and card iteration. The design feedback session consists of 4 parts: Part I focuses on becoming familiar with the cards, Part II involves a design activity, Part III includes a critique session, and Part IV is the wrap-up

Phase 2: Design Feedback. In phase 2, we conducted a remote one-on-one design feedback session with participants using Zoom and Miro. The objective was to understand how the participants interpreted the cards and how they used them in the design process. We divided the session into four parts (Fig. 2). **Part I** focused on getting participants' initial reactions to the cards and familiarizing themselves with cards through think-aloud sessions. In **Part II**, we conducted a rapid design activity to explore how participants used the card deck for a specific design challenge. In **Part III**, we asked participants to critique the cards by sharing the card deck's strengths, weaknesses, and potential opportunities for improvement. Lastly, in **Part IV**, we wrapped up the study by asking participants to share their experiences and provide suggestions for the design feedback session. All the sessions were video & audio recorded.

Phase 3: Card Iteration. After the one-on-one design feedback session, we performed card iteration based on the most recent participant's feedback. Card iteration typically included changes in language or wording, visuals & aesthetics, and card content. In addition, we made conceptual changes, such as adding new cards to the deck or clarifying content, etc. We had frequent discussions within the research team to decide on making changes to the cards. The card iteration phase lasted from several hours to 1-2 days, depending on the volume of changes needed to be made to the card deck. We used the updated card deck during the next participant's onboarding and design feedback session. Thus, we verified the effectiveness of the performed changes to the translational cards.

We continue repeating the three phases until new participants' responses do not trigger major changes in the design of the translational tool, such as adding new cards, changing card contents, etc. In addition to participants' feedback on the design of the cards, we consider how they used the most recent version of the card deck during the design activity (part II of phase 2) while deciding to continue the RIR method. Thus, through the RIR method, we ensure that the translational tools are ready to be used effectively in practice.

3 STUDY EXPERIENCE AND LESSONS LEARNED FROM CONDUCTING RIR METHOD

In this section, we discuss our reflections and lessons learned while conducting the RIR method.

Onboarding Session. We found that the time between onboarding and design feedback session is valuable because it allowed participants to go through the cards and other study materials (e.g., activity instructions) at their convenience to become familiarized with the deck and study procedure. As participants were not involved in the making of the card deck, the onboarding session often gave participants the required thinking time to present their feedback systematically.

Lesson #1: To elicit deeper reflections and adequate feedback on the translational design tool's content, we recommend researchers share study materials (e.g., translational

design tools, instruction manuals, worksheets, etc.) a few days before the scheduled study session.

Activities. Activities (i.e., think-aloud, rapid design, critique, etc.) during the design feedback phase allowed us to gather participants' feedback and diverse perspectives through different types and levels of engagement with the cards. We deliberately select activities that would be situated around participants' existing design practices. We observed participants developed a better understanding while having a hands-on experience and using the card deck during the design activity. The critique activity allowed participants to define their own context for reflecting on the cards. Participants tried to reflect on the cards' strengths and weaknesses through the lens of their earlier projects. They also highlighted new opportunities where the cards may be applied. For instance, most participants saw the potential to use the cards beyond societal resilience in times of crisis. They discussed the value of the card deck in supporting designs for stigmatized societal issues, individuals living with disability, and sustainability.

Lesson #2: To gather holistic feedback and perspectives on translational design tools, we encourage researchers to use multiple activities, such as think-aloud, design challenges, critique sessions, etc., that can provide participants with different levels of engagement with the tools. Additionally, researchers should select activities that resemble participants' existing design practices.

Interactions with Cards. One of the benefits of conducting the remote study was that we observed various ways participants interacted with the digital card deck throughout the study. We used the virtual whiteboard tool, Miro, which is popular among UX researchers and designers [6, 14]. The Miro and its built-in functionalities supported deck access, interaction, and manipulation. We created a Miro frame and organized the cards in a tabular format, which made it easy for participants to navigate the cards. Fundamental built-in interactions in Miro support visualization of the cards at different levels of detail. For instance, the helicopter view³ of Miro allowed the participants to view the entire card deck at once, whereas they would have had to spread out the cards on a table or whiteboard in a physical setting. Participants used the zoom-in and out feature to navigate specific cards and focus on the content in more detail. In addition, we observed participants make copies of the cards and add sticky notes to annotate with their ideas and design rationale during the design activity. Participants pointed out that making copies of the cards allowed them to have a project-specific card deck marked with their notes while preserving the original card deck.

Although remote studies enable new interactions with digital cards, they can prevent certain interactions that were only possible with physical cards. For instance, for a double-sided card deck, people can flip the physical cards to view the content of the back, whereas such interaction might not be possible on the Miro board. To overcome this limitation, we organized the front and back sides of the card side by side on the Miro, which allowed the participants to access the double-sided card deck at once without flipping them.

Lesson #3: We recommend being mindful of the different affordances of digital platforms that can impact participants' card interaction and interpretation. While keeping this in mind, we encourage researchers to prioritize creating digital design cards, which can enhance participants' ability to navigate and interact with the cards.

Researcher Perspectives. We summarize the challenges faced while conducting the study and how we overcame these challenges to facilitate future researchers employing a similar research method for designing translational cards.

Schedule Management. To ensure rapid iterations between versions of the cards, we need to have a careful time management plan for the card iteration phase. The card iteration phase typically took several hours to days, depending on the volume of changes needed to be made to the card design and content. This phase is crucial, where we devoted most of our time to work on the cards. We adopted several ways to have a quick turnaround of the deck. For instance, the primary researcher maintained a log of participants' feedback, required revisions, and performed iterations to facilitate asynchronous collaboration among the research team. We also maintained a timeline for reaching out to the participants and scheduling the onboarding and design feedback sessions. Despite rigorous planning, schedule disruptions occurred when four participants had to reschedule their study session appointments due to personal reasoning, poor Internet connectivity, insufficient laptop charge to continue the session, etc. Such disruptions had more impact on the study than any other methods due to the iterative nature of the RIR method. For instance, when a participant rescheduled the design feedback session, it delayed the card iteration phase and onboarding of the next participant. We were flexible in making significant updates to the timeline to accommodate such delays.

Lesson #4: We recommend preparing a detailed and compressed time management plan for the card iteration phase to ensure a quick turnaround of the card deck. Researchers should take measures to streamline the card iteration phase, such as orchestrating asynchronous collaboration among the research team to discuss, approve, and execute changes rapidly based on feedback. In addition, researchers should be flexible in their planning to accommodate unwanted changes or disruptions (e.g., rescheduling an appointment).

Data Collection and Analysis. One of the benefits of conducting the study in a remote setting using Miro was the availability of different types of card interaction data. We asked participants to share their screens over Zoom during the design feedback session to capture their interactions with the cards. Participants zoomed in on a particular card or sections of a card as they explored the card deck, or hovered their cursors on specific segments of cards when they used the cards in the design activity allowing the researchers to know precisely what the participants were looking at. In addition to qualitative data, such interactions can be a source of data to interpret participants' reflections on the structure of the cards and the usefulness of each section for their creative process. Participants also used sticky notes while interacting with the cards to annotate their ideas and feedback. Although the range of interaction data added to the richness of the data, we were unaware of any tools

³<https://miro.com/blog/features/use-cases-to-speed-up-collaboration-in-your-team/>

that met our needs for capturing and exporting the data in a format that was useful for data analysis. We relied on video recording participants' screens to capture the data and will resort to manual video encoding for data analysis. For a large group of participants, it would be worth investigating effective methods of collecting and analyzing such interaction data.

Lesson #5: We advise being mindful of ways to capture participants' various interactions with translational design cards because these interactions could provide useful insights. In addition to traditional analysis methods (i.e., thematic analysis, affinity diagramming, etc.), researchers should be open to exploring approaches, such as video encoding, mouse heatmap, etc., for analyzing collected data.

Deciding on Making Changes to Card Deck. We faced challenges while deciding on which feedback to act upon when making changes to the card design and content. In general, we exercised our judgment while making decisions about changes to the language and wording, the addition of icons/images, changes in color scheme, and aesthetics and visual representation. It was not always obvious if a feedback should be incorporated into the next version of the card deck. For some feedback, we immediately made the changes on the card deck after a single session, such as when a participant was confused by the language or content organization on a card. For other instances, we waited for additional participants to provide the same feedback, such as when a participant did not like the color scheme, but it was not mentioned by others. We had frequent discussions within the research team to decide on making conceptual changes, such as adding new cards to the deck, content for clarification, and changes reflecting participants' mental models. The RIR method allowed rapid testing of the effectiveness of the changes made in response to feedback with enough participants. The rapid testing helped us to obtain more information and make refined design decisions. There were instances when we undid a change that was corrected by a future participant. To tackle such back-and-forth changes, we never overwrite or delete prior versions but rather duplicate our workspace while making changes. It also allowed us to go back and see the progression of our creative journey.

Lesson #6: We advise making immediate changes when feedback concerns any issues around confusion or lack of clarity and holding off changes for further participant confirmation when feedback is related to preferences (i.e., aesthetics). The RIR method is powerful in that if researchers make changes in response to a participant's feedback which gets conflicting feedback from future participants, they can roll back those changes to prior versions. We advise researchers to save their work non-destructively rather than overwriting the previous versions.

4 CONCLUSION AND FUTURE DIRECTIONS

We present the RIR method for HCI researchers to support the design of translational tools. This work can be a starting point in understanding how the RIR method facilitates the evolution of more refined translational design cards through exhaustive rapid iterations to ensure that the cards are helpful during the design process. There were several aspects of this research method that

might require future exploration. First, we planned a rapid design activity during phase 2 to investigate how participants used the cards in practice, however further research is needed to plan design activity based on the goals of the translational tool. Second, we conducted the study with designers to make research knowledge more accessible to them. Future research should explore the outcomes of conducting the method involving other stakeholders, such as product managers, project managers, etc., based on the goal of the RIR method. Lastly, we used the online whiteboard Miro to conduct the study remotely. Built-in functionalities of Miro prompted various interactions with cards that could provide useful insights. Future research could explore how to collect these interaction data automatically from Miro and analyze them. In addition, future studies could focus on exploring the use of various online platforms for the RIR method, how those platforms might create new types of data, and what ways can be adopted to collect data effortlessly.

Our study experience, perspectives, and recommendations might provide insightful lessons for HCI researchers who intend to apply the RIR for designing translational design tools for various contexts. We encourage other researchers to adopt this method, find additional strengths and weaknesses, and report them. Our future goal is to investigate the efficacy of the RIR method while using the refined translational card deck in collaborative workshops with professional designers and explore how they use the cards in design process to design socio-technical systems for societal resilience.

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