

# RBI: A New Approach to Rapid Generation of Big Ideas When Working in Intergenerational Design Teams

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## ABSTRACT

In an ideal world, there is time for all members of an intergenerational design team of children and adults to present, aggregate, and evaluate the suggestions that come out of work done with a design target concurrently by sub-groups during a session. However, when presented with either a relatively large set of features or not enough copies of prototypes to distribute, time or resource constraints mean this is not always realistic in practice. For those design experiences when time is short and quick design ideas are needed, a rapid evaluation of designs and big ideas generation can be utilized to provide feedback on numerous designs and/or features.

## Author Keywords

Children; design; design techniques; design methods.

## ACM Classification Keywords

D2.2. Design Tools and Techniques: Evolutionary prototyping, User interfaces

H5.2. Information Interfaces and Presentation: User Interfaces: User-centered design.

## INTRODUCTION

Cooperative Inquiry (CI) was derived from Participatory Design methodology, specifically to facilitate designing technologies with children [3, 5, 12]. CI makes use of low-fidelity design techniques to enable adults and children, age 7 to 11, to work together as design partners [2, 6, 11]. It is important to note that the children on a CI design team are at an age where they understand how to use the technology, still have a sense of playfulness when it comes to technology, and a sense of logic to what they want of technology. However, children of this age are still developing how they express their thoughts and ideas [9], and the adults and children on a team need to see each other as peers in the endeavor [1].

A key element to supporting and encouraging participation in PD is utilizing design techniques that are developed with the needs of different team members in mind. A number of existing techniques have been developed to support CI teams in the generation of ideas and comments and feedback [14]. The Rapid Big Ideas (RBI) technique amalgamates and extends existing design techniques, including "Sticky Noting," "Layered Elaboration," and "Bags of Stuff."

With "Sticky Noting," the design team is divided into sub-groups and using sticky-notes to write short comments upon they then record the likes, dislikes, and design ideas that are generated. While those teams are working in parallel, the notes are collected and organized on a wall [3]. With "Layered Elaboration" the design team sub-groups have a small set of visual designs rotate among the teams in three rotations, with each team providing feedback and ideas via transparent overlays and then described the changes they've made [13]. With the "Bags of Stuff" brainstorming approach, the design team engages in blue-sky low-fidelity prototyping with arts and crafts supplies, and the children in the sub-groups explain what they've built while an adult takes bullet notes [2].

Though design sessions that utilize these techniques are very different, all three types of session share a common element, the generation of "Big Ideas" as well as an assortment of specific comments and ideas that can be used by the developers in the iteration of the design. These "Big Ideas" are an important outcome, and are the result the adults performing a real-time cluster analysis of patterns and themes in the comments or notes or descriptions that are presented or collected. The adults are then looking for overlapping ideas across all sub-groups that represent the design elements on which to focus and change [7]

However, these existing methods are time and resource intense. Contributing to the growing body of techniques for use in PD with children, in this paper we describe the Rapid Big Ideas technique, which specifically addresses situations where a design team is faced with an abundance of evaluation targets and either a dearth of time or a sparseness of available prototype artifacts. Either of these situations can create a setting in which existing approaches that assume all of a team's sub-groups can work simultaneously on the entire evaluation target would be problematic. This is where the new RBI approach can be applied.

## RAPID BIG IDEAS

As is often the case, the first step in building an effective design session is to identify the constraints presented by the design scenario, and consider where in the lifecycle of the design you are and the type and level of ideas for changes you desire. This new Rapid Big Ideas technique is meant to be used when your intergenerational design team has a large set of mock-ups, prototypes, or implementations to evaluate and where time and resources are limited. This

can lean towards the "Facilitated Design" end of the IBF participatory continuum' spectrum [10] more than some other techniques, but can be appropriate where there is an immediate goal of identifying the most critical aspects of an existing design that still need improvement. With RBI, the design session time is divided into several shorter sub-session rotations through different design stations, followed by a summative activity.

### **Station Creation**

Once selecting this technique as a candidate, the team needs to identify what the stations will be and be mindful of the fact that each sub-teams will see the stations in a different order. While issues such as learning effect are not typically of concern in this type of participatory design, it needs to be considered here to minimize the impact the order might have on the types of comments. For this reason, having the stations represent either distinct, unrelated elements of the overall design or making sure that being prepared for users visiting the different parts of the site in an unspecified order is one of the session goals. If working with an external partner, they can play a very important role in helping the design team identify what these stations should be since the logical sub-divisions of the project as seen by the development team likely has an established logic that can be built upon.

### **Station Logistics**

It is possible to support more stations that there will be sub-groups. Although time and fatigue must be considered when asking design partners to provide feedback on multiple design aspects in quick succession, having as few as two or three sub-groups visit each station can provide the rapid feedback necessary to the design. To support this, an adult "conductor" keeps track of how many times each station has been visited, remaining time in each rotation, and whether any station should be seen more or less often than others based on need and/or complexity.

### **Sub-Group Logistics**

Before the session begins, any adult developers who are brought it to participate with the sub-groups should be briefed on the ways in which this approach might differ from other techniques they have previously utilized so that the way in which the big ideas are generated does not come as a surprise. Specifically, they should understand in advance that the outcomes are likely to be less extensive though each idea might have more immediate impact, that the presentation of information by the children during their summary will be less detailed, and that the adult debriefing will address these issues to some extent. These points should then be book-ended during that adult debrief.

Another aspect of the logistics that is related to the rapid nature of this technique is making sure that each sub-group of the team has at least one adult member who is already very familiar with that station's element to help clarify small questions that arise.

### **Station Preparation**

Once the stations are identified, each is supplied with pens, markers, sticky notes, and a large, writeable surface (such as an easel-sized pad of paper) on which to assemble the notes and make comments. If a printed version of a design element is part of a station, it is attached to that large surface to support direct annotations. As part of the rapid-design approach, there will also be a "mission" associated with each station to help jump-start the sub-team working there.

### **RBI Rotations**

With things prepared to begin, the design team divides into smaller groups of child and adult design partners, and these sub-groups rotate through several design stations during the course of the session. During each rotation each-subgroup will interact with a different/distinct element or aspect of the overall project. To facilitate this, the entire project is partitioned and each of those sub-sets is placed at a different "station" within a large room. This structure allows good spacing between teams (so they are less likely to overhear each other's' discussions) while still maintaining the spirit and reality that the entire group is working as a team to provide feedback and design ideas on a project.

During each rotation, the team members will explore the aspect of the design that has been set out at the station to which they've been assigned and use sticky notes to provide comments and feedback. The activity itself can take different forms but should incorporate a "likes, dislikes, and design ideas" sticky noting approach [4]. This allows the children and adults to work together to generate artifacts that can be studied later by the project leaders while also providing the sub-groups with a way of keeping track of what they've already commented upon and supporting the summative activity that will take place at the end.

### **Summative Activity**

A summative activity is held after the rotations to support the identification of trends and themes in the comments generated across all sub-groups. Other techniques either collect and organize information coming from all of the sub-groups throughout the session (as is done during Sticky Noting) or do so while each sub-group gives a short presentation of what they built during the main portion of the session (as is the case with Bags of Stuff and Big Paper). Due to the more rapid, and potentially more diverse, nature of the rotations that are undertaken, a new approach is used to accomplish this. After the rotations are completed the entire team comes together in a circle and each child in the team is asked to say what their favorite or most memorable thing was across all stations (their biggest "like") and to also indicate their biggest desire for an addition across all stations (in a sense, their biggest "design idea"). An adult member of the team will write these on a board near the circle while iteratively identifying the trends and themes. After each child has had their turn, a final "was anything big missed?" question is asked before ending the full-team part of the session.

## **Adult Debrief**

The final step of this technique is to do an adults-only debrief where the adult members of the design team and the project team review the trends and themes identified on the board and review the sticky notes from each station to look for more specific design comments. While we might have also been asking the design team about "dislikes" during the session, we likely would not ask the children to highlight their "favorite" of these dislikes so as to close the session on a more positive note for the team. The "dislikes" notes would, however, still be explored during the adult debriefing. By gathering information about the design elements the children did not like, the top picks of ideas they had on how to improve the design, and their top exemplars of things that were already being done well, the adult members of the team are well situated to rapidly assemble a list of design modifications with concrete ideas on how to implement those changes.

## **APPLICATIONS OF RAPID BIG IDEAS TECHNIQUE**

To illustrate that this technique could be applied in practical design situations, we utilized it when working with two project partners with appropriate design session needs, and present each of these applications as a case study of how the technique can be used in a cooperative inquiry setting.

### **First Application of Technique: Website**

The first application of this approach we discuss was a website late in its initial production cycle. The site creators had a goal for an initial release, as well as plans to expand and refine the site over the course of the year. The design team had recently explored an in-progress version of the site during a design session and the developers returned looking to have the team provide feedback on the changes that were made to the site's six components as a result of the earlier session. The goal was both to discover specific, high-priority, changes to make to the six current elements of the design in the immediate-term (essentially the next two weeks) as well as some guidance for prioritizing the next phase of enhancements (the following few months).

While we normally would have worked on this project via several design sessions were there time available, the new Rapid Design approach was applied here to achieve those goals, exploring all of the site components in a timely manner (specifically, after a single 90 minute design session and 30 minute debriefing). As the intergenerational design team had recently interacted with an earlier version of the site, and because a big part of the development team's goal was looking for concrete changes that could be quickly integrated into the individual components of the site it was determined that the session would be run with a set of printouts of the site's pages.

By design, the technique's station-based model would generally steer the design team away from thinking about site-wide changes (which would fall under long-term planning and be the subject of future design sessions) and help provide incremental suggestions, which is exactly what

the development team desired in this case due to their impending production deadline.

The design team divided into four sub-groups, each of which had two children with one or two adults. Four rotations were planned, which would provide 16 "visits" to be spread across the six stations, corresponding to the six site components. This allowed each component to be given attention by at least two sub-groups of the design team, and in some cases three of the sub-groups. Since some site components would not get three visits, one member of the design team observed the early rotations to determine which stations seemed most likely to benefit from a third visit. Additionally, due to the context of the session, some of the visits were chosen specifically to make sure that children on the team who had expressed interest in certain parts of the site would get to visit that station.

At each station, the sub-groups were provided with printouts of one component of the site and asked to use sticky notes to comment directly on the printouts as well as to indicate the things they'd most like to see changed (which were collected on big easel-sized sheets of paper). If they saw that another sub-group had already made their comment on the printouts, they were asked to write "+1" on it to indicate they were going to suggest that too. For the big paper suggestions, they were told they could add another sticky note with their own wording on it.

After the rotations were completed, the entire team came back together around a whiteboard for the accelerated "big idea" generation phase. The children were each asked to say what their favorite change to the site was (since they had all seen it in its previous iteration) as well as the change they were most looking forward to. This served to both provide a nice sense of closure for the children on the team and to support the adults in quickly identifying some themes for most-liked improvements and most-desired changes or additions.

There was then a short (30 minute) debriefing between the adults on the design team and the development team where the sticky notes and comments that had been collected for each component were discussed and used to identify the most critical changes to make as well as those with the best time-to-impact ratio that could be made in the immediate future, while also thinking about the next phases of the site's development. While the immediate changes were all (by design) incremental, the longer-term ideas generated did have a wider scope to them. It was also felt that the "big ideas" generation activity did manage to represent most of the themes that were identified during the debriefing on this occasion.

### **Second Application of Technique: Hardware**

For the second practical application of the Rapid Evaluation of Designs and Big Ideas Generation approach, we entered the context of a hardware design project that was in its early stages. Where time and the breadth of components that

needed to be explored were the major driving factors for the original use of the approach, the motivation was different here. Specifically, the station-based approach followed by a "big ideas" wrap-up was seen as being able to address two aspects of the hardware team's scenario. First, since this was a session that was very early in the project's lifecycle, there was only one hardware prototype built. This was done in part due to an expectation that significant changes would be made in the next iteration of the hardware based on both the experiences with, and comments about, the current version. Second, the hardware research team was asking the intergenerational design team to help with the design of the new devices by exploring both the research team's prototype as well as several existing solutions from related but different domains.

There were two existing sets of hardware along with the prototype set, so three stations were used for the design session. The design team sub-groups each had three children and two or three adults. In this instance, each sub-group had the opportunity to visit every station. While working at a station, each sub-group used the hardware set at that station. They were asked to use "Sticky Noting" in a "likes, dislikes, and design ideas" mini-session. During a traditional sticky noting session of this type, one or two adults would collect the sticky notes as they were written and work on a large wall to cluster similar notes and identify overarching trends in the comments. However, each of the three different stations needed a "large wall" of sticky notes of its own in this case to help identify the trends for each hardware approach. To support this, each station had a large easel-sized white sheet of paper that was divided into three sections (one for "like" and one for "dislikes" and one for "design ideas"). The adults then clustered the sticky notes comments, looking for trends and themes at each station (Figure 1).

Once each sub-group had visited each hardware station, the full team sat in a semi-circle around a wall painted with dry-erase finish for the accelerated "big idea" generation phase. In this scenario, the children were each asked to choose what their favorite "like" was of the entire session and what their favorite "design idea" was. Once again this provided the children with closure for the session. However, in this case it also provided the adults with a macro view of the views of the child members of the design team across all three hardware sets.

For the debriefing, the adults in the design team looked for commonalities among the favorites that the children had mentioned during the "big ideas" generation phase and discussed them with the research team to inform their next steps. Additionally, the research team was able to take the three large sheets of paper full of sticky notes, clustered by local themes, with them for more in-depth review and later discussion.



**Figure 1. The sticky note clusters as identified on one of the stations' large, easel-sized, white sheets of paper.**

## CONCLUSIONS AND FUTURE WORK

One of the most important outcomes of applying this technique of rapid evaluation of designs and big ideas generation in the presented cases was that team design team was able to undertake the desired design sessions within the time constraints and with the resources provided.

The application of RBI generated a set of big ideas and guidance for design revisions and future directions that was satisfactory to the external partners on whose projects we worked. Specifically, during the debriefing sessions the adult partners indicated they felt the technique lead to good coverage of the ideas that they recalled from the rotations, and did a good job identifying major trends and common opinions/design ideas. Both project teams expressed having sufficient feedback to return to their development cycle with a better understanding of the next moves to make. However, it was also felt that both the broadness and depth of some of the feedback was abbreviated.

Future work could take two directions. One would be to look at and more formally explore the strengths and deficits of this new approach when compared to existing ones through a controlled set of design challenges. The other would be to apply it to design teams other than those that are intergenerational and include children as partners.

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