Abstract
This position paper preliminarily reports on StoryWalk, a new technique for intergenerational co-design. StoryWalk’s use by KidsteamUB has led to the design of different two kinds of technology: an experience for a planetarium, and a tangible password tool for children. StoryWalk includes traditional storyboarding with sticky note feedback while including physical activity to help designers who have trouble sitting still. We believe that this technique is valid for participatory design of a wide array of technologies including those that support learning sciences.

Author Keywords
Design; Children; Participatory Design

ACM Classification Keywords
D.2.2 [Design Tools and Techniques]: Evolutionary Prototyping

Introduction
When discussing designing with children and adults and the inherent right of the individual to design the technologies that support and surround them, we found that there are few accommodations for designing with children who do not want to sit still. We learned this the hard way during our first year of KidsteamUB. The many
techniques that the authors learned while at the University of Maryland’s Kidsteam just didn’t work for us at the University of Baltimore. Trying to ascertain why is the subject of another paper, instead, we focused on listening and making the design sessions work with our participants. This included empowering them to independently “work” and having them move around a big space in order to include physical activity.

Background

Paper prototyping is a common and recommended technique for including users in the design process[4]. Paper prototyping can include storyboards, screen mock-ups, or vignettes that explain a technology’s use in context [2]. They can be used as a way for designers to communicate with each other as well as evaluated as part of usability tests.

FACIT PD [6] is a framework for developing and evaluating new techniques for use in intergenerational design. This framework presents eight dimensions in which participatory design techniques can be evaluated. These dimensions include partner experience, need for accommodation, design space, maturity of design, cost, portability, technology level, and physical interaction.

KidsteamUB is an intergenerational design team at the University of Baltimore that incorporates Cooperative Inquiry [1] in an urban environment. All of the children in KidsteamUB are between the ages of seven and eleven and live within geographical area of Baltimore City. This urban focus is an important distinction between this instantiation of Cooperative Inquiry and other, more suburban teams.

Process

StoryWalk combines two elements of traditional user experience design into a new way for children to provide feedback to designers. First, designers create storyboards describing vignettes of user experiences in way similar to a large comic strip. Second, design partners (children and adults) can comment on the drawings with sticky notes.

Setup

Design researchers create traditional storyboards for the experience or technology they are trying to develop. A4 or letter sized paper works well for each storyboard. The researchers lay out the storyboards on a large horizontal surface, such as a table. The orientation of the storyboards is such that the bottoms’ of the storyboards are all aligned so they can be read from the widest part of the table. The table should not be against a wall as someone will need to go behind the table in the next phase.

The participants are given notes that can be repositioned, such as Post-It notes, and writing instruments like magic markers.

Presentation & Elaboration

In this stage, the participants, both adults and children, stay on one of the widest sides of the table. One researcher goes to the opposite side of the table and walks the participants through the scenario (or scenarios). Once that is completed, the participants begin to elaborate and comment on the designs by writing notes and sticking them on or beneath the storyboards and then walking to the next one.

Clarification and recording

After 20 minutes, the group gathers around the start of the table. The facilitator begins with the first panel and
reads the comments. The facilitator can try to interpret the comments or ask for clarification. While this is occurring, a scribe records the highlights of the conversation on a per panel basis. The facilitator can move on to the next panel when the group is ready.

**Debriefing**
After the participants leave the design session, the researchers meet to discuss the outcomes. The researchers take turns discussing their observations and develop plans for the design’s next steps.

**Projects**
We used this technique in two different projects: a planetarium experience and a tangible password system for children.

**Planetarium Experience**
We used this technique as part of the third session of a series of design sessions dedicated to the Maryland Science Center. The goal was to explore new ways to engage children and their families with astronomy. For this session, the design partners were presented with a series of images used to depict the process of traveling to and seeing a planetarium show at the Maryland Science Center. Content was based on current show topics, as well as topics that partners showed interest in during the original. Some portions of the presentation were left intentionally blank in order to solicit ideas from our partners as to how the presentation should transition, as well as, what the audience might do or experience after the show ends. After the presentation, each storyboard was individually laid out across a long table for them to physically walk along. Partners were supplied with sticky notes and asked to write their likes, dislikes or design ideas, as they pertain to each board. While some likes and dislikes were given about the presentation, most of the feedback came in the form of design ideas.

Design partners were especially interested in learning detailed information about the role of stars and space in history, how this history pertains to Maryland, and the technology used to explore outer space. Interactivity was also important to the design team, but they were torn on how this interactivity might take place. It was also acknowledged that if interactivity is implemented, it is important that it be distributed fairly amongst the entire audience. There was also some interest about taking a quiz on what they learned from the presentation, as well as some thought-provoking questions based on “mysterious” topics about outer space, such as the existence of alien life.

**Amulets**
For this session, partners were initially engaged in a discussion about how we keep things safe in the real world, followed by how we do this same thing in the digital realm. This discussion was used to help spur new ideas about how to protect things in the digital realm. Partners were then presented with three different storyboards depicting three potential new ways to access online accounts securely. One adult walked through each set of storyboards with all of the partners present. Partners were then given sticky notes and asked to go through each set and add what they liked or disliked about the idea, or how it could be made better. After all the design partners finished their critique, the group came back together to discuss the results.

The three scenarios included a digitally-based key on your computer that would unlock your accounts, a physical amulet that could unlock your account by placing it near a computer, as well as a picture-password-based login.
Most of the partners felt very strongly towards the physical amulet because they liked the idea of a custom amulet that only they could use to unlock their personal accounts. There was a concern that whoever was making these amulets was just trying to make money off of kids, and that your amulet could be stolen and used to access your account. Partners generally liked the idea of a picture-password, but need more options to create their password. Here too, partners feared hackers/thieves may be able to access their accounts. The digital key did not receive as much negative critique, but still didn’t seem incredibly appealing to our design partners either.

We took this design further in a later session by making amulets with a 3D printer and adhering Near Field Communication (NFC) chips to them. After a session investigating the amulets’ use with mobile devices, we built a custom NFC reader using an Arduino prototyping board. The design partners were able to try amulets with the NFC reader and see how they worked. This research will be further explored through Design Probes [3] in the homes of children who will participate in a future version of Online Kidsteam [5].

Conclusion & Future Work
StoryWalk provides a new way to design with children by eliciting feedback in a linear and narrative way. This technique enables children to collaboratively elaborate on an experience design in a way that includes physical activity. We plan on using this for design sessions where ideas need to be refined and at times when child design partners need to be active to stay engaged.

Because this technique worked well for designing both an experience and a technology, we feel that it could be a useful addition to intergenerational designers’ toolkits.

StoryWalk is an example of listening to participants and understanding their needs in developing new ways to work together.

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References