National Living Laboratory 2014-15 Cohort Stipend Final Report
Children's Museum of Southern Minnesota
& the Center for Developmental Science at Gustavus Adolphus College

Who Are We?

The Children's Museum of Southern Minnesota (CMSM) seeks to be the catalyst for building a stronger, more vibrant community around play so that all children in the region share in a bright future of opportunity and well-being. They accomplish this by igniting the natural curiosity of every child through the power of play in a dynamic, awe-inspiring environment. Intended end users, who the Museum must serve to accomplish its mission and vision, are children and their learning families in Southern Minnesota with children under the age of 9 served most fully and continuously.

The Center for Developmental Science (CDS) is a research facility that focuses on early childhood cognitive development in the Department of Psychological Science at Gustavus Adolphus College, a small residential undergraduate liberal arts college. Researchers design fun activities for children, including watching short movies, playing games, or solving puzzles. During these activities, child's behaviors, such as eye-gaze, object choices, and vocalizations are studied to help understand how children think, learn, and remember.

The CDS and the CMSM have been working together for the past 7 years to develop creative ways to help each other achieve institution outcomes through collaboration. In the Fall of 2013, Kyle Chambers, Co-Director of CDS, organized a meeting with Peter Olson, Executive Director of CMSM, and Deb Johnson, Education & Exhibits Director at CMSM, to introduce them to the Living Lab Model and discuss the possibility of incorporating Living Lab into their existing partnership. The benefits to all parties were abundantly clear. Making science come alive in the museum context aligned with the Museum's strategic goals and improving undergraduate oral communication as well as understanding of developmental differences appealed to the CDS directors.

In the Spring of 2014, CMSM and CDS piloted the Living Lab concept at the museum's temporary site. Students taking Advanced Research Methods in Developmental Science course at Gustavus taught by Kyle Chambers helped establish the infrastructure necessary to have a Living Lab, and then replicated and extended previous developmental studies that had been conducted in a museum context as one of their course assignments. The experience was very promising; therefore, CMSM and CDS worked together to plan for a Living Lab in the building that CMSM was renovating to become the new and permanent home of the Museum in May 2015.

Goals of the NLL Stipend Award

Knowing that the CMSM would be renovating their new building location during a large portion of the stipend period, our primary goals for the award were to identify and procure the furniture and equipment needed to have a Living Lab once the new museum space opened. In particular, we wanted to develop professional signage that was consistent with the museum's new branding guidelines as well as the branding guidelines of Gustavus, Living Lab, and NSF. We also wanted to design a cabinet that could provide secure storage for A/V equipment, serve to display signage for Living Laboratory, and help define a space for conducting the experiments (pictured below). Finally, we hoped to begin piloting experiments in the newly created space during the Museum's April 2015 soft openings.

Enhancing the Visitor Experience

The CMSM started having soft-openings in their new space in April 2015. During these openings, undergraduate research assistants working in the CDS began conducting experiments in Living Lab (pictured below). You'll notice that the space is located centrally in the museum where families can easily see the research being conducted and discuss the research with the undergraduate assistants. Living Lab

was open for 4, 2-hour shifts during the April soft openings. During that time, we had 39 participants, completed 15 educational opportunities, and had 7 staff discussions. Even during these first shifts, Living Lab fascinated visitors as one described, “It's always interesting when working with small humans”.

Mutual Professional Development

In addition to Deb Johnson from CMSM and Kyle Chambers from CDS, the Museum and Academic Living Laboratory Team was recently joined by Megan Flod Johnson, Program Manager at CMSM, and Patricia Reeder, Co-Director of CDS. Johnson and Chambers have engaged in mutual professional development by attending National Living Laboratory workshops in Madison, WI, during Spring 2014, and most recently in Portland, OR this past April. Now that the museum is open, they intend to integrate mutual professional development between museum staff and undergraduate research assistants in the form of Greetings, joint Living Lab training sessions, and research symposia. Though early in its development, both parties are clearly pleased with the relationship. As a museum staff member observed, “The Children's Museum of Southern Minnesota values our Living Lab partnership with Gustavus Adolphus College. Bringing "living" science into the museum for parents and children to actively observe and engage with is so valuable and aligns well with our museum's strategic goals.” And as one research assistant described, “Living Lab challenged me in ways that a traditional classroom couldn’t. In one class I gained hands on experience with developmental psychology, statistics, public speaking, graphic design, and even construction.”

Research Happenings at Our Site

Toy companies such as Magna-Tiles® and Lego® often provide examples of objects that can be made with their products to give children and parents a starting point. Examples are intended to demonstrate possible ways of interacting with the objects with the hope that children will create more intricate structures using the basics they have learned from the examples, but are examples effective? In our current study we are investigating how different instructions and examples affect how children play with magnetic building tiles and which ones lead to increased engagement and complex creations. For example, we are currently comparing verbal (e.g., “These are Magna-Tiles®, can you use them to build a house? ”) and visual (e.g., “These are Magna-Tiles®, can you use them to build a house? [as template of 2D house is shown]”). Follow up studies will continue to explore the most effective examples to give to children depending on the task and circumstance to help them learn through play.

Outcomes and Future Goals

In the upcoming year, we have 3 primary goals. First, we would like to advance our mutual professional development by holding joint training sessions attended by both museum play workers and Gustavus research assistants, having Gustavus students and faculty present research findings at museum staff education meetings, and integrating the Greeting process into our Living Lab. Next, we will also be developing a series of Research Toys that can be used by the museum. These will be developed as a course project for students taking Child Development (PSY 234) at Gustavus Adolphus College during both the Fall and Spring semester of the 2015-2016 academic year. Finally, we will be unveiling results and outcomes from Living Laboratory research to the Southern Minnesota community through poster symposia for the public and presentations at the CMSM Board meetings and the Center for Childhood. In summary, CMSM and CDS are grateful for the NSF funding, participating in the Living Laboratory Model has been transformative for both organizations, and we are excited to continue our work together in the Living Lab Community, increasing scientific literacy in Southern Minnesota and training the next-generation of collaborative researchers with the skills to communicate the scientific enterprise with different audiences.

Picture 1 & 2. *Living Laboratory in the center of the Children's Museum of Southern Minnesota. Custom-made wooden cabinet is used for storage, signage, and to help define the space.*

Picture 3. *Gustavus Adolphus College undergraduate research assistant working with a participant in Living Laboratory at the Children's Museum of Southern Minnesota.*