

Chapter 11

Connections at the Family Level: Supporting Parents and Caring Adults to Engage Youth in Learning about Computers and Technology

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ABSTRACT

We discuss the multiple roles played by parents and other caring adults in the homes of young STEM learners, highlighting existing knowledge and connections as well as desired supports. We report on a series of workshops for parents and other caring adults, held in conjunction with a 20-week computational making program for middle school girls from underrepresented communities. The workshops accomplish three tasks: 1. build a community of participants who engage in collaborative work and share best practices, resources, and knowledge; 2. introduce a framework of roles to ground what participants do to support the girls' STEM learning; and 3. engage participants in technical design processes as they work through projects similar to those completed by the middle school girls in the program. We share insights and challenges that emerged from our analysis of these workshops, and present ideas for refinement and adaptation of our workshop model based upon lessons learned.

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INTRODUCTION

I enjoyed making my LED flower card (although the drawing wasn't that great) and showing it to my daughter...and yes, she gave me a high five. (Miriam, workshop participant)

Creating a future in which the fields of computer science and engineering are represented by a broad spectrum of learners of diverse genders, races, and socioeconomic status demands that we take an ecological approach to the design of learning environments. While large-scale surveys of children's use of media reveal youth increasingly immersed in technologically-mediated activities (Lenhart, 2015; Rideout, 2015), there remain critical inequities in terms of who is participating in ways that support pathways to future computational learning opportunities, resulting in repetitive cycles of underserved and underrepresented populations. For example, despite increasing jobs predicted in the areas of engineering and computer science, there is a well-documented and consistent drop in the number of women in these fields at each level of advancement, especially amongst minority women (Corbett & Hill, 2015). Decisions about whether or not to pursue STEM careers are oftentimes made early (e.g. Renninger, Nieswandt, & Hidi, 2015; Maltese & Tai, 2010) and decisions about participation in learning opportunities during middle and high school years have been linked to factors such as prior experience, interest, and sense of fit with community (Margolis & Fischer, 2003; Margolis et al., 2008). These and other studies (e.g. Barron, Gomez, Pinkard, & Martin, 2014) highlight how adults in the lives of young learners can mediate such challenges by supporting persistence through complex work, making connections between existing interests and available opportunities, and providing a sense of belonging.

To truly broaden participation, we need to not only design quality programs and interventions for youth, but also better design strategies that can connect families and communities who have been underrepresented in STEM fields to the learning environments in which their children are immersed. Furthermore, this work needs to recognize and leverage existing networks, histories, cultures, and expertise found in those communities, taking an asset-based approach to design and implementation. In this chapter, we focus on the importance of parents and other caring adults in the homes of young learners. Specifically, we describe the conceptualization and development of workshops for parents and other caring adults implemented in conjunction with a 20-week computational making program for middle school girls, and we share insights from our pilot year. The workshops were designed by the Digital Youth Network (DYN) to foster a learning community of caring adults to further support the growing computational knowledge of girls in the program during and beyond their participation.

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