



MULTIMEDIA RESEARCH

33 BROWNS LANE • BELLPORT, NY 11713 • (631) 286-8925

SUMMATIVE EVALUATION OF *SCIGIRLS* SEASON TWO

Barbara N. Flagg, Ed.D., Director

Produced by Twin Cities Public Television, St. Paul, MN, and sponsored by NSF, *SciGirls* (*SG*) is a multimedia project for upper grade-school and middle-school tweens. Weekly half-hour episodes are tied in with web and outreach activities in the fields of science, technology and engineering. Each half-hour episode of the *SG* television series follows a different group of enthusiastic, *real* middle school *SciGirls* who collaborate, communicate, investigate, engineer and discover. They are accompanied by two animated characters – a plucky *SciGirl* named Izzie and her best friend Jake, who tie the series together as they solve problems they have by learning from the real-world *SciGirls*.

The summative evaluation of *SciGirls* Season One engineering episodes revealed that the television series succeeded in attracting and engaging girls by incorporating evidence-based engagement strategies, the *SciGirls Seven* framework, into the programs. The programming effectively used fictional and factual narrative stories and characters to improve significantly viewers' understanding of the engineering design process when compared to a control group who viewed a reading literacy series. And the shows provided vicarious experiences through which viewers increased their confidence in their ability to execute the steps of the engineering design process. Viewers found the shows interesting, inspiring, fun and educational and wanted to watch more shows.

SciGirls Season Two introduced an innovative set of clues that were integrated into the broadcast episodes and were intended to push viewers to online activities that extend the episodes' stories. In each episode, Izzie and sequences of brief animations draw attention to important investigative objects in the science inquiry process and encourage viewers to visit pbskidsgo.org to play *Pick'm Stick'm*, which extends the learning process. *Pick'm Stick'm* presents an I Spy type game (*Pick'm*) to earn stickers for a mashup collage interactive (*Stick'm*) where users can create their own unique *SciGirls* stories.

Supported by NSF grant #1114739, Multimedia Research, an independent evaluation group, implemented a summative evaluation of the *SG* multimedia project during the fall of 2012. The post-only study focused on (1) girls' engagement with the television series; (2) the appeal and impact of the experimental broadcast/website connection; (3) the strength of the series to motivate viewers to do their own science investigation; and (4) the extent to which viewers recall steps of the science inquiry process.

A sample of 87 fifth grade girls, spread equally around seven national sites, included 36% minorities. The girls rated their interest in science as "a lot" (55%), "somewhat" (43%) or "a little" (2%). The girls also self-rated how well they performed in science in school as "really well" (44%), "pretty good" (46%), or "okay" (9%). Girls not interested in science or who had previously visited the *SciGirls* website were not included in the evaluation sample. With parental and child consent, participants viewed three *SG* episodes, once a week over three weeks. The treatment episodes were *Aquabots*, *Mother Nature's Shoes*, and *Habitat Havoc*. Participants could visit the *SG* website at any time but were required to visit and play a show-related *Pick'm Stick'm* game after viewing the third show. After the third viewing period, each

girl was interviewed individually in a one hour session. The interviews included quantitative rating questions and open-ended qualitative questions related to each of the four major research goals listed above.

Viewers were highly engaged with Season Two episodes. One goal of the Season Two summative evaluation was to examine if and how a set of *SG* shows focused on science inquiry engages viewers. Almost all Season Two viewers wanted to watch more *SG* shows, which they described as informative, interesting and fun. They enjoyed the investigative stories and were intrigued by seeing failure and persistence as part of the process. Viewers were surprised by some of the results and observations of the investigations; and a group of viewers were surprised by the capabilities of the onscreen girls, inspiring viewers to think that they too could do science and engineering projects. **Season Two's findings reinforce the findings of Season One's evaluation that providing positive vicarious experiences via female onscreen characters can significantly influence viewers' confidence in their own abilities – as in “if they can do it, so can I.”**

The episode/website connection motivated girls to visit the website after viewing and provided them with creative ways to explore further the investigation stories. New to Season Two is an experiment that embeds clues for an online game, *Pick'm Stick'm*, within the broadcast episodes in order to motivate girls to visit the *SG* website. Almost all viewers noticed the features within the shows that referred to the online activity, and one-third of the girls were motivated to visit the *SG* website voluntarily. Viewers felt the experience of seeing items in a TV show and then using those items in an online game was cool, fun, or helpful for successful game play. Players liked the challenge of earning stickers in the timed *Pick'm* game, the connection to the *Stick'm* activity, and the freedom to create one's own unique *Stick'm* picture. In their *Stick'm* picture for the episode *Habitat Havoc*, nine of ten girls used stickers representing major components of the investigation. Three-quarters of the girls reported that the show influenced what they chose to put in the picture and could describe how the stickers they used reflected the investigation story of the onscreen girls. **The integrated connection of the *Pick'mStick'm* activity to the episodes motivated girls to explore the series' STEM content beyond just viewing the videos.**

SciGirls episodes motivate viewers to do their own science investigation. The third goal of the Season Two summative evaluation was to assess the strength of the series to give viewers the knowledge and confidence to do their own science investigation. **Almost nine of ten viewers were interested in carrying out their own science investigation with friends, and all viewers agreed that watching *SciGirls* would help them do so.** Viewers felt that the series showed them steps of investigation, inspired them, encouraged them to reach out to adult mentors and gave them confidence.

SciGirls episodes can aid girls' understanding of the steps of science inquiry. The television series showcases the *process* of STEM and includes a wide variety of projects, incorporating both scientific inquiry and engineering design. Season Two's evaluation assessed the extent to which viewers' recalled the steps of the science inquiry process as they were presented in *Habitat Havoc*, one of the three *SG* episodes viewed. A majority of viewers spontaneously recalled four of five science inquiry steps as they were modeled by *SciGirls* in the episode. Three-quarters of viewers could describe details of three or more steps. **Thus, just as the summative evaluation of Season One's engineering episodes found that television can influence viewers' application of the engineering design process, the evaluation of a Season Two science inquiry episode reveals that viewing *SciGirls* can aid girls' understanding of the process of science inquiry.**