To test this hypothesis, we created and implemented a variety of communication. Further, we hypothesize that Ohio State University students assisting in the context provides an effective platform for COSI guests to engage in the belief that participating in one of our programs has a greater impact process, while providing families with a fun way to learn science and an experience, and interactive videoconference programs. Our preliminary results demonstrate that teaching science in the Generation Rx Lab at the Center of Science and Industry (COSI) is a multi-faceted drug education research lab that aims to:

- Educate the public about medication safety
- Measure the impact of the experience on college student's science communication and teaching skills
- Provide an opportunity to share my passion for science.

In this lab, guests of all ages conduct hands-on experiments related to the science of drug action. Because drug topics spark young learners’ interest, we hypothesize that teaching science through a pharmacology context provides an effective platform for COSI guests to engage in the scientific process, as well as to learn biology, and chemistry concepts.

We conducted a survey of 303 COSI guests following completion of each hands-on experiment. The survey was designed to assess the impact of the experience on learning science concepts. The survey included questions about the guests’ experiences in the Generation Rx Lab, including their level of agreement with statements such as, “I gained a new perspective on science,” and “I have a better understanding of the importance of science.” The statistical analysis of the survey data showed significant improvements in science communication skills, with an average increase of 62.5% in respondents’ agreement with the statements.

We also surveyed 8 students who participated in the Generation Rx Lab program for their feedback. The students rated the program highly, with an average score of 91.7% agreement on statements such as, “The experience helped me to better understand the importance of science.”

**Daily Shows: A Family Experience**

A. Our daily shows are an unique experience for families—

<table>
<thead>
<tr>
<th>Parents agree:</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>An engaging experience at COSI.</td>
<td>91.7%</td>
<td>7.9%</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>A fun way to learn science.</td>
<td>93.3%</td>
<td>6.3%</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>An opportunity for our group to learn about safety practices.</td>
<td>87.0%</td>
<td>12.3%</td>
<td>0.3%</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>An opportunity for my group to learn how to safely use medicines.</td>
<td>64.1%</td>
<td>23.6%</td>
<td>6.9%</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>An added value to my overall COSI experience.</td>
<td>93.3%</td>
<td>6.4%</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
</tr>
</tbody>
</table>

**Field Trips: Immersing Students in 21st Century Skills**

A. Teachers strongly agree with our educational approach:

<table>
<thead>
<tr>
<th>Teachers agree:</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you feel your experience in the Generation Rx Lab was an effective way to teach the following concepts?</td>
<td>62.5%</td>
<td>37.5%</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>62.5%</td>
<td>37.5%</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>50%</td>
<td>12.5%</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Process Skills</td>
<td>62.5%</td>
<td>36.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EDUCATIONAL PROGRAMS**

**METHODS**

**Daily Shows**

Following completion of each hands-on experiment, we asked an adult from each family to complete a brief survey about their experience. For Part A, all responses are based on the Likert Scale and reported as the frequency for each response (n=303 surveys). For Part B, adults determine if the Generation Rx Lab experience had a greater, same, or lower impact on their family’s ability to learn principles of medication safety compared to traditional approaches. We first tallied the number of responses for each approach, then calculated the corresponding “% Response” (n=303 surveys).

**Field Trips**

Following completion of the field trip, we asked the teacher chaperone to complete a brief survey about their experience. For Part A, all responses are based on the Likert Scale and reported as the frequency for each response (n=8 surveys). For Part B, teachers completed a retrospective pre-/post-survey that reports the number of students involved in each process (statements in graph), both in their classroom (before the program) and in the Generation Rx Lab (during the program). Responses are based on the scale: 1=none of the students, none of the time; 7=all the students, all the time. We first calculated the mean score for each process reported, both in the teacher’s classroom and in the Generation Rx Lab, then calculated the percent difference for each process based on the mean scores. This difference is reported as “% Improvement” (data shown, error bars represent SEM). We assessed statistical significance by comparing the mean scores reported (in their classroom vs. in the Generation Rx Lab) for each process using a paired student’s t-test (*p < 0.05, **p < 0.01; n=8 surveys).

**CONCLUSIONS**

We conclude that teaching science through a pharmacology context provides:

- An effective and engaging platform for museum guests and students to learn biology and chemistry principles.
- Families with a unique opportunity to think like a scientist and conduct hands-on experiments while adding value to their visit.
- An innovative approach to teach principles of medication safety.
- Students with a unique opportunity to engage in the scientific process, think critically, and build interest in STEM.

Furthermore, our educational programs provide OSU students with a unique opportunity to improve their science communication skills while giving back to their community and sharing their passion for science.

**STUDENT INVOLVEMENT**

Undergraduate students from the College of Pharmacy staff the lab’s educational programs as part of their course in the enrollment, “Science Communication and Engagement”.

Upon graduating, students complete a survey about their teaching experience in the lab. Preliminary data suggests the Generation Rx Lab teaching experience improves student’s ability to communicate science while increasing their interests in both teaching and science outreach.

**Student feedback:**

“Very interesting and helpful for developing scientific concepts to people of various ages and educational backgrounds. I think this skill will help explain disease treatments to patients in the future.”

**You be the Pharmacist:**

“This rotation was an excellent forum for developing communication skills. Being prepared to adjust the discussion at hand based on the age and background knowledge of the audience was a challenge, but provided an exceptional foundation to continue building communication skills as a future practitioner.”

**THE OHIO STATE UNIVERSITY COLLEGE OF PHARMACY**

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**Student feedback:**

“I’ve improved my ability to explain scientific concepts to people of various ages and educational backgrounds. I think this skill will help explain disease treatments to patients in the future.”

**You be the Pharmacist:**

“This rotation was an excellent forum for developing communication skills. Being prepared to adjust the discussion at hand based on the age and background knowledge of the audience was a challenge, but provided an exceptional foundation to continue building communication skills as a future practitioner.”