INTRODUCTION

In Anatomy Academy, a community outreach service-learning program, we teach anatomy, physiology, and nutrition concepts as an effort to combat the obesity epidemic through educational intervention, and inspire kids to pursue science as a career.

Our program recruits pre-professional students to serve as mentors – to help teach science concepts to school aged children on a weekly basis in their assigned school classrooms.

Anatomy Academy found tremendous success at a local charter school specialized in teaching children on the autism spectrum.

We learned that children with autism flourish in a learning environment augmented by the presence of paraprofessional teachers and an engaged learning curriculum.

We report that children with ASD become highly engaged in the Anatomy Academy learning environment as a result of a synergistic combination of interaction with caring and inspired Mentors, and an engaged curriculum teaching the wonders of the human body.

METHODS

We wanted to answer one question:

Do Students on the autism spectrum participate in learning activities because Anatomy Academy provides an engaged learning activities, one on one attention with Mentor paraprofessionals, or both?

We changed the Senses lesson for 5th grade students and 8th grade students (5th grade cognitive level) to the following:

1. Started the hour with only the Coordinators reading age-appropriate science material to all the kids in a group (think quiet reading time) for 10 minutes
2. Mentors showed up to do individual Mentor-Student reading time for 10 minutes
3. Switched to a typical Mentor-Student engaged activity for 10 minutes
   • Blood pressures, breathing/heart sounds auscultation, otoscopy
   • Students were filmed throughout the lesson for analysis. The students levels on the spectrum were assessed according to the DSM-5 criteria using operation demographics for verbal communication, functional behavior, and social interactions (Figure 1).

<table>
<thead>
<tr>
<th>Verbal Communication</th>
<th>Functional Behavior</th>
<th>Social Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – No Language Ability</td>
<td>1 – No functional ability</td>
<td>1 – No social ability</td>
</tr>
<tr>
<td>2 – Below average age appropriate language ability</td>
<td>2 – Below average age appropriate functioning ability</td>
<td>2 – Below average social ability</td>
</tr>
<tr>
<td>3 – Age appropriate language ability</td>
<td>3 – Age appropriate functioning ability</td>
<td>3 – Age appropriate social ability</td>
</tr>
<tr>
<td>4 – Above average age appropriate language ability</td>
<td>4 – Above average age appropriate functioning ability</td>
<td>4 – Above average social ability</td>
</tr>
<tr>
<td>5 – Excellent language ability</td>
<td>5 – Excellent functioning ability</td>
<td>5 – Excellent social ability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Verbal Communication</th>
<th>Functional Behavior</th>
<th>Social Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject 1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Subject 2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Subject 3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Subject 4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Subject 5</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Three students from the 5th grade classroom and three students from the 8th grade classroom with similar operational demographics and DSM-5 severity levels were then selected for observation in this study (Figure 2).

RESULTS

• Observations of the learning activities in the 5th and 8th Grade (5th Grade cognitive level) classrooms:

  1. Whole-Class Reading Activity
     • Students were bored and fidgety during this activity.
     • Lack of eye contact predominated.
     • Students were focused on events occurring outside of the class activity.
     • The passive learning environment prevented the students from taking a role in the activity.

  2. Student-Mentor Reading Activity
     • Behavior improved, although the students were still fidgety.
     • Distractions were minimized as mentors helped to redirect their attention.
     • Peer-distractions were also significantly reduced.
     • Student-mentor connection helped facilitate interest in the lesson.

  3. Student-Mentor Engaged Activity
     • Medical devices intrigued the students and curiosity led the students to utilize their mentor to learn how to operate the devices.
     • Many students began asking their mentors relevant questions for the first time, thus driving their own engagement in the activity.
     • Questions appeared to draw the students closer to their mentor.
     • Distraction levels were significantly lower.

• The Paraprofessional
     • Helped engage and redirect the student’s attention.
     • Facilitated interest through connection with the student.

• The Engaged Activity
     • Provided a role for the student to join the activity with.
     • Provided a means to facilitate relevant questions to the topic at hand.

CONCLUSIONS

• Paraprofessional mentoring in the academic environment can help minimize distraction and change behavior in students on the autism spectrum.

• By implementing engaged learning activities with paraprofessional mentoring, the students are more likely to begin asking relevant questions and participating in the lesson.

• Students on the autism spectrum will likely find more success in their medical sciences curricula as paraprofessionals use engaging learning activities in small group settings.

ACKNOWLEDGEMENTS

• The Albert Schweitzer Fellowship
• Brigham Young University, Mentoring Environment Grant
• Brigham Young University, David O. McKay Scholarly and Creative Works Grant
• Utah Valley University, Engaged Learning Grant