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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.
- program recruits pre-professional students to serve as • Our paraprofessionals – 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).

	1	1
Verbal Communication	Functional Behavior	Social II
1 – No Language Ability	1 – No functional ability	1 – No s
2 – Below average age appropriate	2 – Below average age appropriate	2 – Belc
language ability	functioning ability	
3 – Age appropriate language	3 – Age appropriate functioning	3 – Age
ability	ability	
4 – Above average age appropriate	4 – Above average age appropriate	4 – Abo
language ability	functioning ability	social a
5 – Excellent language ability	5 – Excellent functioning ability	5 – Exce

• Three students from the 5^{th} 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).

Figure 2.			
	Verbal	Functional	Social
	Communication	Behavior	Interaction
Subject 1	2	2	2
Subject 2	2	3	2
Subject 3	2	2	2
Subject 4	2	2	2
Subject 5	2	2	1
Subject 6	2	2	2

Engaging Verbal and Nonverbal Autism Spectrum Elementary School Students in the Anatomy Academy Service-learning Environment

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ve average age appropriate ellent social ability



Student-Mentor Reading Activity



Student-Mentor Engaged Activity





RESULTS

- Observations of the learning activities in the 5^{th} and 8^{th} Grade (5^{th} Grade cognitive level) classrooms: . Whole-Class Reading Activity
 - Students were bored and fidgety during this activity.
 - Lack of eye contact predominated.
 - 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.
- 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.

- 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.

CONCLUSIONS

- 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.

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- Students were focused on events occurring outside of the class
- Peer-distractions were also significantly reduced.
- Questions appeared to draw the students closer to their mentor.
- Distraction levels were significantly lower.
- Provided a means to facilitate relevant questions to the topic at hand.

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

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