

## STEM SUMMER CAMP: INCORPORATING ACTIVE LEARNING IN THE CLASSROOM TO INCREASE RETENTION AND INTEREST IN STEM

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### INTRODUCTION

For the purpose of this research study the terms, learn by doing and active learning, are used cohesively. This research focuses on the positive effects and benefits of incorporating active learning in the classroom. Active learning is especially important during the summer because many students lose the information they learned in school and the previous year. Due to many students forgetting, many teachers must reteach and go over material from the year before.

Educational camps are one of the solutions to this problem. During summer, many students want to play, spend time with their friends, and some don't want to think about school. Camps give students time away from the typical material and learning environment.

Camps also give students the opportunity to make new friends and have fun while learning. If active learning is incorporated into more school and camp curriculums retention and interest in school will increase. Attitudes towards learning and school will also become more positive.

### STUDY GOALS

- Increase youth's comprehension and desire to learn
- Increase motivational learning
- Heighten confidence, self-security, and identity in learning
- Reinforce past teachings
- Connection to life and science
- Create positive attitudes towards learning

### CONCEPTUAL MODEL

Student centered learning, active learning, introduces students to different and more diverse learning techniques. Learning by doing "promotes student collaboration" (Holmes, 2015, 215) and increases participation and engagement in the classroom. Active learning has had a positive impact in the education system. "It has been proven to show improved scores in retention in students" (Wesolowski, D., 2019). When students participate in hands on activities, their memory and retention are improved. Active learning, especially during summer camp, allows students to explore and learn more about the world around them rather taking lectures. Not only does active learning improve learning, it "also enhances their confidence" (Mekonnen, 18, 2020)

### METHODS

This study utilized surveys and narratives to collect quantitative and qualitative data. This technique was used to understand more about, not only the students, but those around them and how active learning impacts their educational experiences.

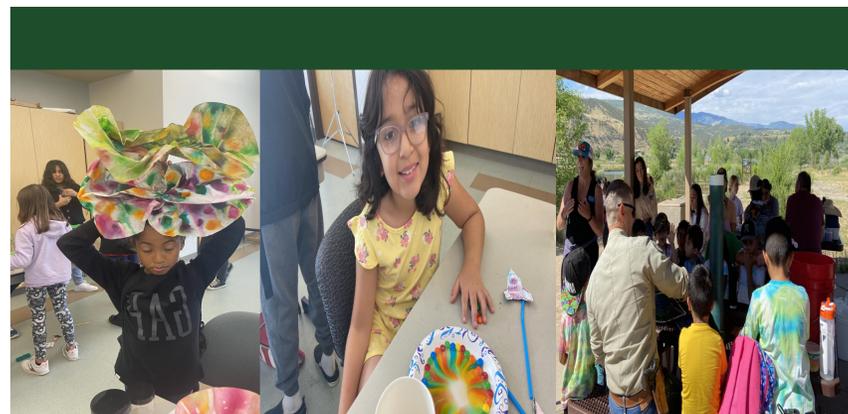
There were three main groups that were involved in this study. The first are the students. There were 20 students who ranged from 6 to 15 years old. The second group was the teachers. There were 5 teachers surveyed and the youngest teacher is 18 years old. The last group surveyed were three parents.

Each group had different questions, but the common theme was how much and what the students learned. Although this study is student oriented, it was very important to get information from the parents and teachers.

Students were asked whether they liked science or engineering and how many hours they spent outside, with friends, and family in a week, including camp.

Teachers were asked if they could recommend the camp to other people, how their students reacted to hands on activities compared to worksheets, how the camp could be improved, what STEM activities did they like teaching, and what fun moment will they treasure from the camp.

Lastly, parents were asked if they would enroll their child again next year, what was the mood of the classroom, did their child feel comfortable in the classroom, what important moment, lesson, or field trip impacted or helped expand their child's knowledge about STEM.



### RESULTS

All the responses and narratives gathered were very positive. This data showed that active learning was more memorable than any other learning techniques because most students remembered more of what they made, the experiments, and the field trips.

Psychology explains that people remember the first and last moment of any event. This is evident in this study because students mostly remembered what they did in the first day of the week and the last day. The camp hours were Monday through Thursday, 8:30a.m.-1p.m. Every Monday teachers started new STEM material that matched the field trips that were held every Thursday.

The most popular week was the experiments week. Students made slime, green tea face masks, and many more fun activities. During that week students were more energetic, talkative, and happier. Students were excited to learn and explore science. In a normal week there were at least 4-5 hands on activities that were about animals, survival, plants, and bug. Normal weeks were also less messy but evidently, students like messier learning because it requires more energy and hands.

### CONCLUSION



Overall, there is a positive correlation between active learning and retention. Also, between active learning and interest in STEM. This study shows that children are hands on learners. They learn through touching, making, smelling, and tasting. Their senses stimulate the areas of the brain that stores and process information. Their memories can be shifted from short term to long term.

Many students during the camp had a "oh yeah!" moment where they remembered information from school and then applied to the camp. They've taken so much information with them. Some of them don't know that they'll have another "oh yeah!" moment soon when this information is brought up again.