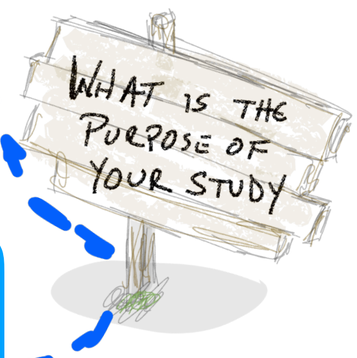
Looking at the effect of adding in a computational thinking activity on the mastery of the high priority learning standards of a curricular unit.

Details

The whole purpose of this project is to improve learning and foster better ties between the various subjects that student's take in school. Going back to the prior literature review on computational thinking (follow link here) I have found that computational thinking has a number of effects on learning. It affects problem solving abilities, student confidence, and creates deeper learning in the subject. At the moment, our staff has been dealing with a lot of change. I cover that more in this blog post (link here). For that reason, I am limiting my research to be of a benefit to me, and more importantly, to the staff so that they can see a direct benefit from this work.

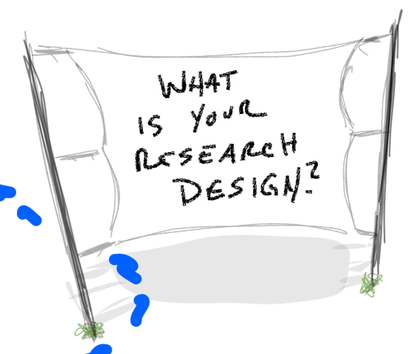


To move toward utilizing computational thinking activities and assessments that generate positive impacts on learning targets in core content areas.

It will be hard for other teachers to see something as intangible as "problem solving skills". By focusing in on the impact the computational thinking activity will have on specific learning targets in class, teachers will be more likely to participate. To that end, having a project that can be tied directly to summative assessment results will help teachers see through the "whirlwind".

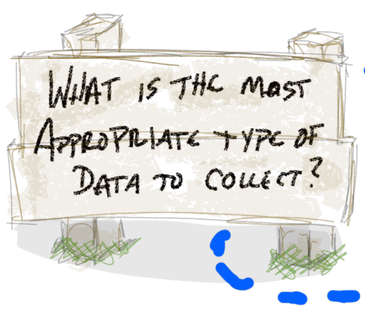
Does the integration of Sphero robots improve students' mastery of learning targets?

For this research, I am focusing the question even more. I will be centering on one particular computational thinking tool, Sphero robots. There are several reasons for this. First, our campus has several robots. Our digital learning coaches are well versed in their use. My students are also comfortable with them (they will be able to assist teachers in the implementation). Finally, there are several examples online of teachers using them. This provides a strong starting point that teachers can readily see. This will aid in collecting quality summative assessment data.



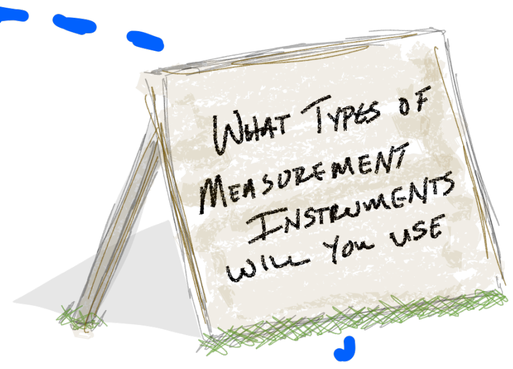
Quantitative Research Design

I am looking for direct impacts to learning that can provide opportunities for implementation with other computational thinking tools. As teachers start to see positive results from the implementation of Sphero, it will support using other tools that are not as well known. Conversely, if the results do not give demonstrative improvements, the teachers will be able to talk with other teachers who have seen results in other areas of the classroom. These are some of the other intangible benefits seen from computational thinking. Going back to the second literature review (link here), I am working on being intentional about the assessment tools being used.



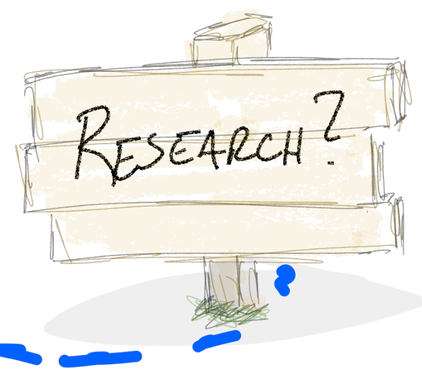
Summative assessment data from teachers using/not using Sphero and computational thinking.

I will be using the summative assessment data that will come from the common assessments used by the teams. This will allow me to do a comparative analysis of the data. It also means that teachers do not have to give a second assessment in their class. We already have a number of assessments given by the state, college board, and the district. Adding another assessment will not lead to a lot of participation by teachers.



Group comparison design

By comparing classes that use the robots with classes that don't, I will be able to show if any effect is seen by adding in the robots. It will be easy for teachers to participate in and easy for the campus to see the results.



Literature Review Focus

This literature review will move toward looking at specific instances of the use of computational thinking in secondary classes. It is unlikely that there is research on the use of Sphero in these instances. For that reason, I will look at the broader use of computational thinking. I am hoping to be able to identify specific projects that will help in narrowing the application instances in my classes. All work found will help to narrow the focus of this research to be more effective and useful in the classroom.