Teaching Strategy for introducing linear algebra at an early stage of education

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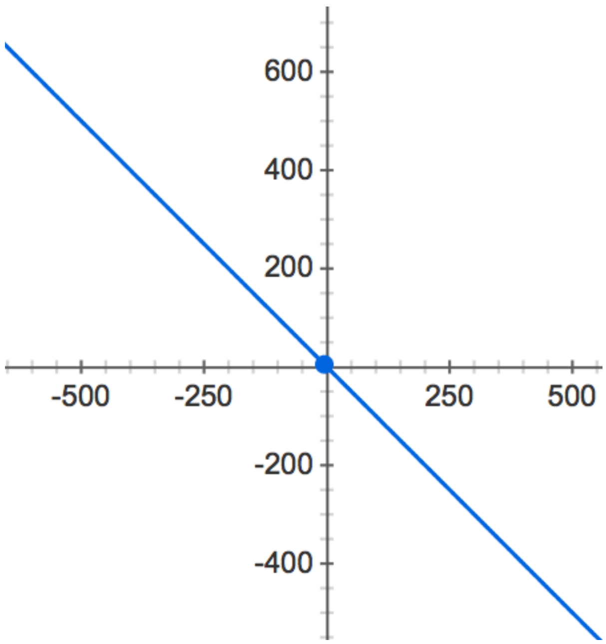
Linear algebra has vast implications in real world. Engineering and computer science use mathematics tools and strategies ranging from linear algebra to calculus. However, such subjects at the theoretical level are difficult for the younger children to grasp. Educational neuroscience provides different insight on the effectiveness of differentiating educational material. Differentiating material has the potential to grasp the attention of various ranges of mindsets. This concept is particular complex to deliver for children at a young age, since they do not have enough background to relate to the abstract material. This paper will discuss a new teaching strategy that could potentially be implemented in early childhood education so the younger can gain tangible knowledge on this abstract subject. This particular strategy of differentiating linear algebra could even harness the hyperactivity of students with ADHD.

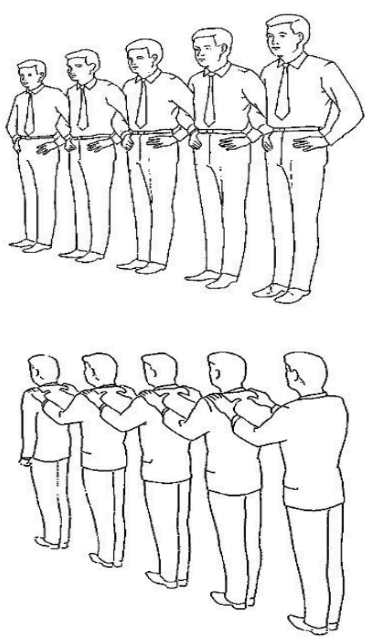
A particular challenge in current methods of mathematical teaching is the lack of associating abstract mathematical concepts with daily life experiences. This makes mathematical understanding and logical thinking rather obsolete in most students. Neuroscience literature has established our capacity to recollect an old memory is dependent on a live stream of inherently assimilated life events (Horner et al 2015). In particular, educational neuroscience literature has establish that mathematical comprehension is essential for a person's development, ability to function and make daily decisions (Braun et al. 2017). The ability to build mathematical confidence so students gain the ability to use and apply mathematics is need for society to flourish (Ernest et al. 2015). Government and commercial policies are largely dependent on financial input and social outputs (Ernest at al. 2015). Therefore, more effective ways to deliver mathematical knowledge at an early age are necessary. Current mathematical teaching techniques deal with a standard systematic repetition, which does not give the student any tangible and relatable comprehension of the subject.

I propose a fun, collaborative, and interactive approach to introduce conceptual understanding of linear algebra at an early stage of childhood development. The focus of the technique deals with replacing the points that make up a linear function with the students in the classroom. In other words, let the students make up the functions. Make an x and y coordinate system in a spacious location with strings or even tape. Then, write the corresponding equation the students are going to represent and let the students know where in the coordinate system they are going to stand. Using this technique, the students can intuitively gain knowledge, through movements, about the ideas behind linear equations. The students can also start to familiarize themselves with the symmetry of shapes and parabolic functions. The teacher can guide the thought process by asking the students what they observe about the shapes the students are making.



Source: https://developers.google.com/chart/

Remember, this teaching strategy deals with letting the students in the classroom be points that make up the mathematical functions.



Source: http://practicalphysics.org

Students and teachers often overlook the simple life activities and their relations to mathematics. One such example is waiting in line (linear function of people) for lunch. If one can incorporate mathematics into daily life, then more students could potentially have more salient memories and understanding of mathematical concepts.

Neuroscience research can be incorporated into this type of teaching strategy by establishing how synchronous the brain waves of each student appear in the Electroencephalography (EEG). This could provide us with a new perspective on how collaborative movement can possibly assist the development of brain networks responsible for abstract mathematical reasoning across different mind sets.

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