Teaching Patterns and Functions through Dance

Summary: It is a well-accepted best practice to use multiple learning styles when teaching different concepts. In an article for *Teaching Children Mathematics*, researchers from the University of Toronto and a Toronto elementary school teacher demonstrate creative and effective ways to teach patterns and functions through, among other things, the use of dance.

Practical Applications

The authors describe how the 1st and 2nd grade students in the study 'danced out' patterns by assigning different moves to be associated with the variable or the constant. For instance, to dance the function $y = 2x + 1$, students might slide to the left for a number of a times equal to the $2x$ part of the function, and then hop once. So, when $x = 1$, two slides, one hop; when $x = 2$, four slides, one hop; etc. Students can also be challenged to think about what the dance would look like in the far future, say if $x = 10$ (twenty slides, one hop).

Importantly, however, the authors **did not start with the dance, they started by building foundational concepts about patterns and functions**. The reason for this is because if you just start with the dancing, students may fail to understand the underlying ideas and instead use what-comes-next thinking (two this time, four that time, must be six this coming time). To build these underlying ideas, the authors:

- First, students were introduced to growing geometric patterns using tiles, with each set of tiles put together under cards that read "Position 1," "Position 2," etc., asking students to help predict the next ones. To try to and avoid the "what-comes-next" reasoning, they skipped from "Position 5" to "Position 10". Students then chose their own patterns and used tiles in pairs to create their own growing positions.
- Next, the researchers used a traditional "function machine" lesson, though in this case their lessons "explicitly highlights the connection between the idea of rules in the context of geometric growing patterns and rules governing the relationship between input and output numbers." To reinforce this even more, they interspersed the growing patterns lessons from above with the function machine lessons.

After these lessons built a foundational understanding of how and why patterns and functions work, the authors then set about cementing the idea. They had the teacher break into an impromptu dance, at first confusing and then delighting the students, and the function-dancing lessons were underway.

Conclusion and Citation

Using multiple learning modalities – including kinesthetic learning through dance -- is a great way to help students internalize difficult early algebra concepts like patterns and functions.

Finch, H., Hawes, Z., Katz, J., & Moss, J. "Choreographing Patterns and Functions" *Teaching Children Mathematics 19.5 (Dec./Jan. 2012/13)*, pp. 302-309. http://bit.ly/Y0HQd9 (subscription only).