Students’ Engagement and Motivation in Number Ball

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Students in K-2nd grade who are racial minorities living in low-income areas have much fewer opportunities to learn operations and algebraic thinking skills in a fun and engaging way. Opportunities to learn whole number representations and magnitudes are essential for children’s later math achievement. I worked with 2nd-grade teachers to create a playful learning landscape called Number Ball designed to provide 2nd graders with additional opportunities to build fluency with whole numbers. Number Ball is a series of scripted games that are designed for teachers to guide students in counting procedures and conducting arithmetic with small number magnitudes. The students will play these games with a point system painted onto the basketball court and a number line on the sideline to keep track of their counting and scoring. Through experimental evaluation of Number Ball, I will determine if this set of games improves students' motivation and emotions towards doing math in a playful setting. Children in low-resource settings often do not have these opportunities to learn through play and teachers may be constrained to rely on traditional instructional math approaches that can demotivate students from learning because they don't find the interest, utility, and importance of math. We test how this new innovation impacts student motivation at a critical point of their math knowledge development and their emotions. This work can provide a new tool for educators to improve math instruction by making it socially engaging, relevant to their lives and a joyful experience. Number Ball can help to mitigate the barriers within schools that might push kids away from achieving their full potential in math.