Does students inhibitory control affect their answers in multiple choice testing?

Introduction

Often teachers will say students just click or guess an answer when multiple choice questions in both NAPLAN and PAT testing. I wondered whether having multiple choice answers impacted students answers or whether this made little or no impact. I also wondered whether time was affected by having multiple choice answers or them having to work out the answers. Did students use inhibitory control or were there Mathematical misconceptions?

Method

Based on the work by Empowering Local Learners on Executive Functions I looked at two ideas

1. Children's answers when given multiple choice or no choice to answers.
2. The time taken to complete a problem when multiple choice is present or not.

A question was chosen based on students PAT-M data. Students were split evenly according to their recent PAT testing scale score. There was a group A and a group B. Group A had the same multiple choice answers as the PAT question, whilst group B had no choices and had to show their working out.

The question was chosen because only 6% of students answered this question correctly in the PAT—M test with 0% from my classroom.

Students were asked to place their hand up when they finished and their time was recorded on their sheet.

Observation

Students varied in the time they took to respond to the answers. Students varied from just over a minute to just over five minutes. On average students who had multiple choice answers took longer to answer the questions at three minutes with students without multiple choice answered it on average in 2 minutes and 33 seconds.

Students provided a variety of answers with most indicating that 5.6 or 5.08 was the smallest and 5.315 was the biggest decimal number.

When marking the results only 1 students answered the question correctly. This student was in Group A with the multiple choice options.

18 students answered the question. This equates to 5.5% almost identical to the original PAT-M data.

Discussion

My original thoughts were when students were made to show working out and made to stop and think, they would show a greater accuracy when answering the question. I also believed that students with multiple choice would show less inhibitory control when in fact they actually took less time to answer the question.

The results suggest that it wasn't anything to do with inhibitory control, but the fact that there are still misconeptions about the place value of decimal numbers among my year 5/6/7 classroom.

QUESTION

Is there misconception about Place Value or is there an issue with students working memory?