The Effects of Using the iPad to Zap Zeros and Increase Student Comprehension of Science Concepts

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Introduction:

The primary purpose of this study was to determine if the frequency of zeros was reduced by allowing students options on the iPad for completion of their assignments as opposed to the traditional paper pencil requirement. Secondly, was to determine if student comprehension of science concepts increased by implementing instruction using the applications that can be administered through the iPad. Student samples included 24 typical 7th grade students in my first hour class containing a 50% breakdown of females and males. Ethnicity breakdown includes 5% Native American, 5% Hispanic, and 90% Caucasian.

Data Collection:

Focus Questions	Data Source 1	Data Source 2	Data Source 3
Does the use of the iPad for assignment completion reduce the frequencies of zeros accepted by students?	The *Student Attitudes About Zeros Survey* was used to analyze student attitudes toward zeros.	The *Student Attitudes About iPads Survey* was used to assess student attitudes toward iPads for completion of assignments.	Assignment completion was compared for iPad vs. paper assignments in Zero Frequency Ratios.
Does the use of the iPad for instruction and completion of assignments increase student comprehension of science skills and concepts?	Pre- & Post-Quarterly Assessments was used to show normalized gains.	The *Student Attitudes About iPads Survey* was used to assess student attitudes toward iPads used for instruction and comprehension.	Interviews were used to see how students feel concerning how the iPad has influenced their comprehension of science.

Treatment:

YEAR 1: NON-TREATMNET

No iPad usage for the selected units of *Heredity* and *Earth and Space*

YEAR 2: BLENDED TREATMENT

A blended usage of iPad applications weaved with traditional assignments for the selected units of *Heredity* and *Earth and Space*

YEAR 3: TREATMENT

A full implementation of the applications associated with the iPad for instruction and completion of assignments for the selected units of *Heredity* and *Earth and Space*.

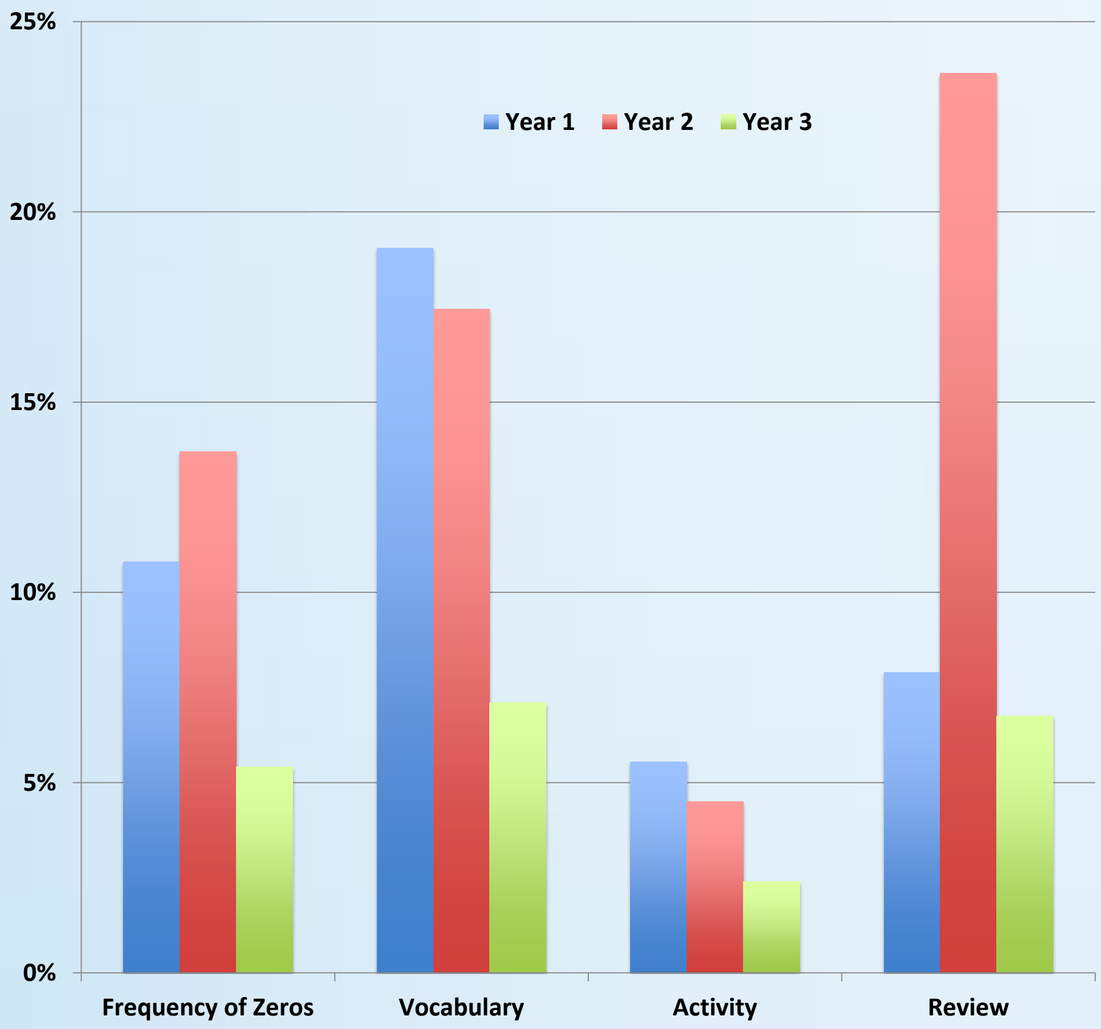

Figure 1. *Frequency of Zeros Comparison,* The frequency of zeros compared for various assignments for all years included, (*N=24*).

What Others Are Saying:

- "Teachers of this generation may find it necessary to utilize the benefit of digital platforms for educating the learners of today" (Aronin, 2011).
- "Educators must accept this new technology to capture the benefits that digital platforms, such as the iPad and the myriad of applications free to the public, offer for our students and our classrooms" (Johnson, 2014).

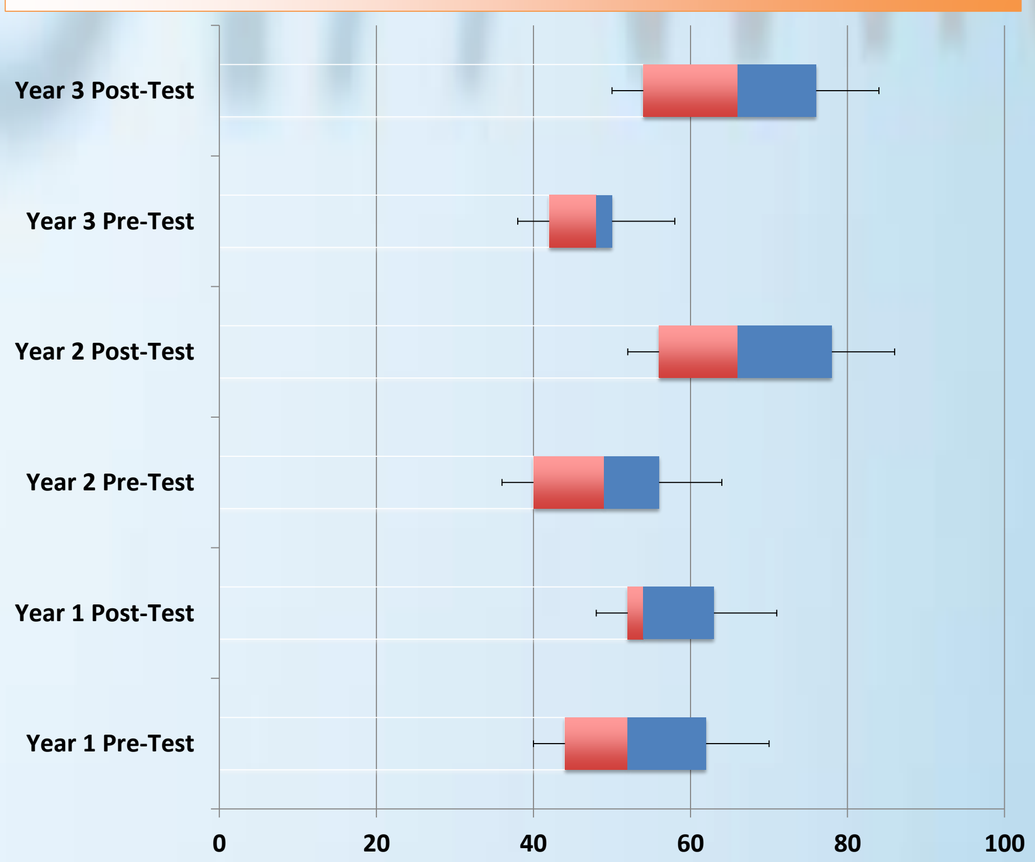

Figure 2. *Quarterly Assessment Pre- and Post-Scientific Concepts Test* (*N=24*).

Results:

- The frequency of zeros for vocabulary assignments decreased from 19.0% in year one, to 17.5% in year two, and 7.0% in year three (Figure 1) .
- Looking at Quarterly Assessment gains, year 1 showed only a 2%, year 2 showed a 17%, and year 3 showed a 18% median score gain in science content knowledge (Figure 2).
- One student commented, "I learn more with the iPad because it is more interesting. It's more like what we will use in our life with technology growing."

References

Aronin, S., & O'Neal, M. (2011). Twenty Ways to Assess Students Using Technology. *Science Scope*, 25-31.

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2014). *NMC Horizon Report: 2014 K-12 Edition*. Austin, Texas: The New Media Consortium.