A Critique and Synthesis:

Children and Educational Technologies

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Introduction

Technology has become ubiquitous and a mainstay in many classrooms throughout North America. Of course, with its growing presence in the classroom, there has been much debate regarding its effectiveness as a teaching tool. As an educator I believe it is vital to stay on top of this debate by examining current research regarding educational technology. In this paper I plan to exemplify this by summarizing, critiquing and synthesizing three articles relating to children and educational technologies. The overarching themes that emerge from this discussion are twofold. Firstly, the discussion looks at the importance of samples in research generalizability. Secondly, the discussion looks at how certain processes of the studies, such as language used, can impact research findings.

Article Summaries and Critiques

Beck and Fetherston

Beck and Fetherston's study investigated whether or not the use of a word processor altered the students' attitudes towards writing. The study concluded that students' writing had improved as a direct result of using a word processor. Their findings led them to believe that students' word-processed works were longer, contained more detail, and had a larger selection of words and that students preferred using the word processor to handwriting.

I have concerns regarding one process of Beck and Fetherston's qualitative study. The researchers chose to use *Story Book Weaver Deluxe* could this could have altered

Beck and Fetherston's findings as it is highly graphical in an almost video game like configuration. In addition, the software enables the user to add background pictures imbedded within the text. While most word processors do in fact allow for the end user to add photos, *Story Book Weaver Deluxe* caters to children due to its highly colourful graphical user interface combined with sound effects and animation. Beck and Fetherston encouraged students to include the use of pictures from the software to help them get started. I believe that if the students were allowed to add pictures (by drawing them onto their paper) to their hand-written works, they would have enjoyed the process of handwritten story writing more than they stated.

I also believe that the small sample size of children from the same class, only two of which being female, affected the study negatively. In addition, I believe the study was altered negatively because students were only studied for a six-week period and only needed to produce four pieces of written work each. I think these aspects of the sample make it very difficult to generalize the findings beyond the study itself.

Miller, Schweingruber, and Brandenburg

This research survey, investigated middle school students' use of technology and the role of gender. Research was conducted throughout four school districts in eight public and private Houston-area middle schools. Both urban and suburban schools were represented as well as students from different socio-economic backgrounds. Students were assigned into 3 socio-economic groups based on the percentage of students who

participated in the free/reduced lunch programs. Focus groups were used to assess the survey questions beforehand. Both closed and open-ended questions were used.

The conclusion of the researchers' study is that the previous disparity between male and female confidence with technology is rapidly narrowing. The study suggests that youth are assimilating technology into their lives at a fast pace and this may result in less disparity between genders in regards to technology use in schools and in turn the workforce. The authors find that almost no gender gap existed in regards to the self-perception of computer ability amongst boys and girls. The researchers also hope that more information about what affects youth will lead to a more effectively structured educational environment.

The authors believe their conclusions represent "America's youth". Their sample, however, only represents a Houston based group of middle-school students, omitting any representation from other areas of the country (Miller, *et al*., 2001). I believe it would be useful to have students included in the study in order to increase the study's generalizability.

A question that I have regarding the researchers' process is how they define the term "use" and "expertise". They clearly mention that they did not define the term "use" for students regarding computer use (Miller et al., 2001). I wonder how both of these terms would be defined. I also wonder if this could have changed the responses of students. I believe more clarity on these terms would be helpful for respondents.

Miller and Robertson

The main question of Miller and Robertson's study was to see what the effects of a commercially available computer game would have on children's computation skills and self-perception.

The researchers conducted their study using a pre-post design. 71 primary students (10 – 11 year olds) from three classes and three different schools participated in the study over the course of ten weeks. From the first school 21 students from the same class played a 'brain training' video game for 20 minutes per day. In that group, there were two comparison groups. From the second school 31 students participated by playing a 'Brain Gym' game and in the third school 19 students acted as a control not using any games.

The study concludes that the game consoles increased students speed of computation, accuracy, and self esteem; however, the researchers cite several weaknesses that may compromise the generalizability of their study.

In Miller and Robertson's study the researchers use students from three schools that are located in the same area of the country. Once again, I believe it would have been advantageous to use a larger number of students and pick from schools located in different parts of the country in order to increase the study's generalizability.

The teacher at the first school is described by the researchers as having been "enthusiastic" about the learning possibilities of the game introduced in the study (Miller & Robertson 2010). I found this description disconcerting as this enthusiasm may have affected the results of the study, which was intended only to study the effects of

the game on students' mental computation and self-perception. The findings may have been skewed because of the teacher's bias towards the game.

Synthesis and Conclusion

Upon analyzing these three articles a few common themes and concerns emerged. Each study possesses problems with its sampling. In all three instances, the small sample size and lack of diversity within the sample groups reduces the generalizablity of the study's findings. For example, Beck and Fetherston used a very small sample size (7 students, 2 being girls) all from the same class at the same school. Miller et al. only had students from the Houston area included in their study and Miller and Robertson only used three classes from three different schools. Due to this issue I find it somewhat difficult to apply the study's findings to real-world situations that I face. Also, within each study, researchers complete certain processes that compromise their findings. In Beck and Fetherston's study, the word processor they chose for their study, *Story Book Weaver Deluxe,* could have contributed to student success and may not have been simply due to the use of a word processor. Miller et. al do not sufficiently define language for their participants which potentially altered participant's answers. Miller and Robertson's use teachers who a have a potential bias towards technology and thus may have affected the study's findings.

Overall, this discussion has given me the opportunity to examine current research literature and determine aspects, which my pose challenges for its findings to be translated into the broader educational population.

References

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