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SPED727

Evidence-Based Assignment #3

Tsuei, M. (2012). Using synchronous peer tutoring system to promote elementary

students’ learning in mathematics. *Computers & Education*, 58(4), 1171-1182.

Background

It has been found that students understand mathematical concepts better when they learn in cooperative groups. Peer tutoring (where one student teaches another) has been shown to help increase understanding at a higher conceptual level. Research was done to see whether there was a significant difference in mathematical understanding when students used an online, synchronous peer tutoring program versus a traditional face-to-face setting.

Research Questions

There were four research questions asked in this study:  
  
RQ1: What are the effects of the G-Math peer tutoring strategy on students’ mathematical learning?

RQ2: What are the effects of the G-Math peer tutoring system on self-concept and attitude toward mathematical learning?

RQ3: What are the associations between students’ characteristics and learning outcomes in the online peer tutoring environment?

RQ4: What are the associations between students’ characteristics and math reasoning skills? And, what is the effect of grouping students with differing abilities on math reasoning skills?

Methods

The study involved 88 children from Taipei, Taiwan, during their last semester of 3rd grade and their first semester of 4th grade. Three classes were involved; two represented the experimental group, and the third was the control group. The experimental group used the G-Math program for peer tutoring sessions in math, while the control group used a traditional face-to-face setting for peer tutoring.

Results

Students who were a part of the experimental group showed a significant increase in mathematical understanding, especially in terms of arithmetic and conceptual problems. There was also a higher level of self-motivation to complete math problems within the experimental group, with many students saying they felt more comfortable making mistakes due to the pseudo-anonymity of the online program. The data also showed that within the experimental group, those students who were classified as “low-achievers” had a higher growth rate for understanding the concepts (vs. “high-achievers), and that students who were paired with someone who was at a different initial level of understanding also showed an increase of the level of reasoning skills (vs. those who were paired with someone on a similar level).

Discussion

As mentioned in the article, peer tutoring is not a new teaching method in elementary math classes, but this research shows there may be significance in the type of setting the tutoring occurs. In the report, it is noted that students feel more comfortable in the online setting because the perception that other people are scrutinizing them, especially if they make a mistake, is taken away. This is a common theme when dealing with online social situations, especially when video chatting is not involved, because people can hide behind the veil of pseudo-anonymity, sometimes taking on a whole new persona. With respect to an academic setting, such as G-Math, the perceived judgment if/when the student gets a wrong answer is diminished, allowing students to feel more confident in their answers, whether they are correct or not. The article states that this confidence carries over into the classroom and social situations, it does not clearly state in what context. Would students who used G-Math still feel confident if they were put back into a traditional setting? This is a question that must be answered, because the goal should be to increase students’ confidence in their abilities in all settings, not just specific ones.

Also, I am assuming that the tutoring was occurring in school, since the article mentions that teachers were present to correct lines of thinking. So another question would be, if the students are still doing this in the classroom, just in a computer game format, would there be similar results if the game was not online? If the results were to yield similar results, it would show that the increases are due to the rewards system of the game aspect, and not because it is being done through a computer.

Overall, this technique is definitely interesting because it is combining an already established learning strategy with a popular technology, and there a definite positive results coming from its use. However, until all questions on why the technology is effective, versus traditional means, are answered, schools might benefit in waiting to implement programs like G-Math. Still, there is no doubt this is a positive step towards the future of learning, and it will be interesting to see what happens with this type of technology in the future.