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Using Hands-on Activities and Manipulatives in Kindergarten

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Research Question

How do students learn in a hands-on learning environment which includes the use of physical and virtual manipulatives?

Hands-on learning refers to a method of instruction involving manipulative materials, problem solving, interactive technology, and authentic experiences to enhance the learning experience and process for students (Clark, Threeton, & Ewing, 2010).

Literature Review

- Clark, Threeton, and Ewing (2010) suggested that hands-on activities are most effective when paired with reflection on knowledge acquisition.
- Alghazo, Alsawaie, and Al-Awidi (2010) concluded that students demonstrated better understanding of mathematics concepts after working with physical and virtual manipulatives.
- Several research studies support the use of hands-on activities in teaching practices if activities are tailored to meet specific student needs and include reflection.
- More long term studies are needed to validate long term effects of hands-on activities on retention of concepts.

Methodology

- 16 Kindergarten students in a rural, Midwest public school
- 15 mathematics lessons and 3 language arts lessons that involved hands-on activities were focused on during this study.
- Data from photographs, (see Figures 1 & 2) sample student work, and teacher journals were collected during student teaching.
- Grounded Theory (Glaser & Strauss, 1967) was used to analyze data.



Figure 1: Students count the number on the dice and identify the correct number on the game board.



Figure 2: Student demonstrates how she writes her numbers during an activity..

Results and Data Analysis

- Student participation, engagement, collaboration, and performance were emerging themes resulting from content analysis of photographs.
- Student work samples analyzed indicated more than half the assessments given after a hands-on activity received a Consistently Applied (CA, 100% correct) or Developing (Dev, greater than 50% correct).
- Teacher journals supported photographic evidence of student participation and engagement in all language arts lessons and 13 mathematics lessons.
- Findings indicate hands-on activities have a positive impact most of the time on participation, engagement, collaboration, and performance.

Conclusion

- Findings indicate that incorporating hands-on activities and manipulative materials into teaching practices to enrich direct instruction has a positive influence on student participation, engagement, collaboration, and performance.
- Findings support Burns and Hamm 's (2011) suggestion that students do in fact benefit from additional materials to supplement the lesson and give them the chance to explore concepts through touch.
- These findings are based on a study completed in only one classroom and one age group. Additional studies need to be conducted over a longer time period.