

IRB SYNOPSIS OF PROPOSAL

**COGNITIVE LEVEL OF DEVELOPMENT AND MATHEMATICAL FLUENCY AMONG
GRADE ONE CHILDREN**

1. The sample population selected to participate in this research study is children who attend Crockett Elementary school in San Marcos CISD. It is anticipated that this research study will include a sample of around 100 children from grade one with a mixture of male and females participants whose ages range from 6-7 years old from a diverse ethnic background. This sample population was selected for this study because they are in the same grade, but are undergoing a critical period of cognitive level of development transitioning from the preoperational to the concrete operational stage of development.
2. Recruitment of subjects will be based on grade level, teacher, and administrator willingness to allow student participation. If the teacher is willing to allow their students to participate in this research study then consent forms will be given to the teacher who will send them home with each student. The consent form details the entire procedures each child will go through while participating in this research study. Only children who bring a signed consent form will be allowed to participate in the research study. Each consent form will have a number assigned to it and will be matched with the students parents to identify eligible child participation.
3. This research study is a quantitative research design comparing preoperational and concrete operational children and their performance on a math fluency assessment of addition and subtraction. The children will take part in a conservation-of-liquid task to determine their level of cognitive development. The preoperational and concrete operational children will be assessed in math fluency using a Math Curriculum-Based Measure (M-CBM) that is timed for 2 minutes. A two-tailed t-test of independent variables will be used to measure the level of significance, at the .05 alpha level, between preoperational and concrete operational children and their math fluency of addition and subtraction.

4. The risks to the children associated with this research study are minimal. The conditions are what each child normally experiences in the classroom at school. The testing instrument is the same that is used as benchmark assessments at each grade level. If a child expresses in anyway that they do not want to participate or continue participating in the research study then they may leave at anytime without consequence.
5. The procedure for protecting students will include providing positive reinforcement and encouragement, clear rules and expectations regarding the behavior of each child while taking each assessment. The procedures for administration of each assessment are standardized to provide consistency among testing groups.
6. The benefits that each subject will receive are positive verbal reinforcement (e.g. “Good job, Way to go, etc.”) and each student will receive a sticker on the hand after participating in this study. The benefits of this proposed research study that may assist educators in providing cognitively appropriate mathematics curriculum and instruction to children in the same grade level, but in different stages of cognitive level of development. Providing appropriate mathematics curriculum and instruction at an early age may increase the future academic success of children in mathematics when no difference in cognitive level of development is present.
7. The participants in this research study will receive a sticker after completing the conservation of liquid task, M-CBM in addition fluency and subtraction fluency.
8. The benefits to the children in this research study and society in general far out weigh the risks associated with the minimal amount of time to conduct this research study.
9. This research study will take place at Crockett Elementary in San Marcos CISD. A letter of support from Rick LaBuhn, Principal has been included as an attachment. The school address is:

- Crockett Elementary

1300 Girard St.
San Marcos, TX 78666

10. This research study proposal serves as the thesis requirement for a master of arts in elementary education from the department of curriculum and instruction at Texas State University. The committee chair supervising the research study is Dr. Barbara Davis and can be contacted by email at bd02@txstate.edu, or phone at (512) 245-8196.
11. The thesis committee has approved this thesis research study. Attached is a signed copy of this agreement.
12. This research study has not been reviewed or sanctioned by another IRB entity.
13. The individuals who will have access to the results of this study during and after completion include the thesis committee, San Marcos CISD personnel, parents of children who participated in this research study, and the IRB personnel.

*This synopsis includes the following attachments:

- I. CITI Training Form of Completion
- II. Consent Form
- III. Single-Skill Probe: Math Curriculum Based Measure (M-CBM) Addition Fluency
- IV. Single-Skill Probe: Math Curriculum Based Measure (M-CBM) Subtraction Fluency
- V. Letter of Support from Principal, Rick LaBuhn
- VI. Thesis Proposal Signature of Committee Approval