Observed Effects of Sheltered Instruction Observation Protocol (SIOP) Methods in Education of Students in Uganda

**Abstract of the Study**

Researchers have examined the effects of the SIOP Sheltered Instruction Observation Protocol model in English Language Learners (ELLs) in the United States. With the SIOP model, teachers use research-based instruction that benefits all students, including ELL students. However, there is a need to examine its effects for students in other countries. This study compares the performance and engagement of students in a school setting in Uganda where they experience instruction that follows part of the SIOP model. Many students in Uganda struggle in mathematics because of the lack of support due to class sizes of 35-105 students. Further, the lack of instructional materials and teacher support is evident in the results from the tests given by the researcher during this study. The study highlights the use of research-based instruction and the local teachers and their methods as the main factors for the results at Ekitangaala. The analysis of the testing data has provided evidence of a well-designed pedagogical learning. The results show that the students are more engaged when they are learning in an environment that supports SIOP research methods and better retains the information gathered from the researcher during this study. The data gathered from the researcher and the local teachers reflect that the methods are working effectively for the students at Ekitangaala. The analysis of this important data has led to an enhanced understanding of the impact of SIOP model on student performance in mathematics.

**Figure 1. Base-line Student Performance in Subjects – Pie Charts**

**Figure 2. After Intervention Student Performance in Subjects – Pie Charts**

**Figure 3. Student Performance in All Three Subjects: Baseline and After Intervention Testing**

**Location of Study**

This study was conducted at Ekitangaala Primary School in Nakasongola, Uganda located in East Africa.

**Typical classroom in Ekitangaala Primary School**

Every student is an English Language Learner. The class sizes are large, ranging from 85-105 students which makes instruction very difficult. This results in very teacher-centered practices. The study during my supervised internship and wanted to get involved and do something to impact the students.

**Methodology**

The researcher taught 3 lessons in 3 different classes over the course of a week. Science, math, and English were the chosen subjects. In these lessons, SIOP features were implemented as interventions teaching programs. The researcher used the SIOP features to plan interventions alongside the classroom teachers. Using models and visuals to make the lesson more comprehensible, incorporating reading, writing, speaking, and listening in each lesson, linking to background experiences and prior knowledge, emphasizing key vocabulary, discussion amongst peers and with the teacher to offer for well-thought out responses, and hands-on materials or manipulatives was used to effectively implement the SIOP model. In Primary 7 English class, the students used all 7 features to create a letter on paper that they do not normally see with a decorated cover using vocabulary from a chapter that the researcher taught. This incorporated two major parts of this class, letter writing and using vocabulary correctly. In Primary 6 science class, the students used 6 features to complete an activity about animals. The researcher incorporated hands-on materials to allow the students to see the animals that they were learning about and had never seen before through the use of small figurines and books with real pictures while working in groups. In Primary 5 math class, the students used all 7 features during the lesson like using recycled bottle caps from their village for counters as needed for multi-digit addition and subtraction while working in groups. Teachers observed, and were later taught 7 key features of the SIOP model for implementation during the next school term.

**Findings and Conclusions**

The baseline data revealed that while over 80% of students did poorly in math before, the after intervention testing data shows that about 12% did poorly in math. The baseline data reveals that while only 1% of students performed excellently in math and science respectively, the after intervention testing data reveals the excellent performance of 40% in math and 85% in science. There is an overall major trend in the results that suggest the SIOP model improved language outcomes for the students involved in all three subject areas. The SIOP model had the greatest impact in the science class. These findings show that the students benefit from instruction using the SIOP model.

**Next Steps**

- Further plans to implement more of the SIOP model to see if all of the components and features can work, or if only some can work for this pedagogical setting for these students and teachers.
- Tests of significance will be applied to future analysis of data.
- A teacher survey within Ekitangaala Primary School, will be conducted to identify how the teachers think students learn best and how they use the SIOP instructional methods.
- Further trainings for the teachers on other aspects of the SIOP model and discussions of their perceptions of the benefits and challenges of the 3 learned features of the SIOP model.
- Expanding this preliminary study into all other subject areas and classes at Ekitangaala Primary School as well as other schools within the district.
- Potential impacts for the educational systems of Uganda and other nations if proven to help students in Uganda.

**Intervention Classes**

This method was shared with the administration at the onset who provided permission for the researcher to implement this program in the three selected classes. The SIOP method was presented to the selected teachers of the three participating classes for their buy-in and collaboration. All teaching staff were provided information about the SIOP method during a staff development workshop day. KAU Professor, Dr. Bishawu Ukeje approved all aspects of this study before implementation in Ekitangaala Primary School.

**Sheltered Instruction Observation Protocol (SIOP)**

The SIOP model is targeted instruction for ELLs that helps to fully develop students’ content and language abilities within a general education class. There are 8 components and 30 features that make up the SIOP model. The researcher incorporated 7 chosen features in the lessons that were taught. Feature 4 from the Lesson Preparation Component: Using supplementary materials to a high degree like making models, graphs, videos, etc., for the lesson to be comprehensible. Feature 6 from the Lesson Preparation Component: Meaningful activities that incorporate reading, writing, speaking, and listening to practice language. Feature 7 from the Building Background Component: Linking concepts explicitly to students’ background experiences. Feature 8 from the Building Background Component: Links explicitly to background knowledge (link past learning to new concepts). Features 9 from the Building Background Component: Key vocabulary emphasized (introduced, written, repeated, and highlighted for students to see). Feature 16 from the Interaction Component: Prompt opportunities for interaction and discussion between teachers and students which encourage well-thought out responses about concepts. Feature 20 from the Practice and Application Component: Hands-on materials or manipulatives provided for students to practice using new concepts.

**Administration and Teacher Support**

With the SIOP model, teachers use research methods and better retain their lesson content for students which allowed for better teaching. All teachers were provided information about the SIOP method, and the students were involved in all the classes.

**Findings and Conclusions**

The results show that the students are more engaged when they are learning in an environment that supports SIOP research methods and better retains the information gathered from the researcher during this study. The data gathered from the researcher and the local teachers reflect that the methods are working effectively for the students at Ekitangaala. The analysis of this important data has led to an enhanced understanding of the impact of SIOP model on student performance in mathematics.