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EVALUATION OF THE SIOP MODEL AND ITS BENEFITS IN TEACHING PROCESS OF THE SCIENCE SUBJECT.

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ABSTRACT

The demands of the modern world have required our country to prepare itself in education. In Panama, some laws have been created aimed at bilingual education. Thus, preparing educators in techniques to teach the English language, Panamá promises to have a bilingual population very soon. For this, the teachers have prepared themselves in the good use of the SIOP® model to satisfy the requirements of the students, who only speak Spanish, and make the learning of the language and contents easy and fun. As a result, children and young people are expected to develop the four linguistic skills, listening, speaking, reading and writing. The main purpose of this research is to evaluate the SIOP® model and its benefits in the children of a school in Panamanian context. In this school, teachers have training in the implementation of SIOP® model.

Step one is to evaluate the SIOP® model and measure how students benefit when receiving guided lessons in the SIOP® format. This is a different method to other traditional methods for planning. This facilitates the learning of the language and contents such as social studies, mathematic, art, and science.

For this research we have based on a mixed method. So, to achieve step one, we have developed a survey and a questionnaire as instruments of our research to provide us with qualitative and quantitative information. We surveyed English and Sciences teachers from Centro Educativo Veracruz. The information collected was analyzed and some comments and suggestions were made based on the bibliographic material that we referred to develop our research.

Key words: teaching, SIOP® model, Science, strategies, benefits.

RESUMEN

El modelo SIOP está compuesto de treinta indicadores agrupados en ocho categorías que ayudan a diseñar y planificar la práctica educativa: preparación, desarrollo del conocimiento previo, input comprensible, estrategias de aprendizaje, interacción, aplicación práctica y repaso-evaluación.

Este modelo tiene en cuenta las necesidades lingüístico-académicas de los estudiantes que están aprendiendo los contenidos en una segunda lengua. Este propone múltiples estrategias y técnicas para enseñar los contenidos de una manera más perceptible a la vez que se fortalece el desarrollo lingüístico de los alumnos.

Después de varios años de estudio y puesta en práctica del modelo en varios lugares de USA, se ofrece un modelo que integra el aprendizaje de contenidos y del lenguaje.

Dentro de la preparación de la unidad didáctica, el SIOP señala la importancia de definir claramente los objetivos, tanto los de contenido como los objetivos de lenguaje y compartirlos con los alumnos.

En Panamá, el modelo de planificación del SIOP está siendo implementado por el programa Panamá Bilingüe donde intenta no solamente aplicarlos al idioma inglés sino a otra materias tales como ciencias naturales, sociales, artística, educación física, y otros a fin de que el sistema de planificación mejore.

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EVALUATION OF THE SIOP MODEL AND ITS BENEFITS IN TEACHING PROCESS OF THE SCIENCE SUBJECT IN STUDENTS OF SECOND GRADE OF CENTRO EDUCATIVO VERACRUZ.

INTRODUCTION

The present research work is an evaluative study of the linguistic-pedagogical model called Sheltered Instruction Observation Protocol (SIOP®). This model is used in different countries around the world to improve education and quality standards. This model helps students to develop their skills, knowledge and linguistic and academic attitudes that allow them to be able to perform a good job in their future workplace.

Worldwide, according to (Lane, 2016) in his article published in Babbel's magazine, the English language is spoken by 360 million people as a mother tongue and by 500 million who speak it as a second language. It is proposed as a successful business language, travel and international relations. Although the question arises if this is because it is relatively easy to learn, but mastery of the English language has become necessary because it has become the most widely used international trade language.

It is a fact that in the official schools of Panamá there is an attempt to introduce the teaching of the English language. There is a curriculum that formalizes the learning of the English language by official school students, formalizing bilingual education to meet the demands that this globalized world demands. Attempts by the government seem to have high expectations. After the creation of the Panamá Bilingual program, our country aims to teach the English language in all official schools. The program was born with the goal to teach students and prepare educators in the English language nationwide to respond to the needs the globalized world demands. So students are prepared in the English language domain to be competitive and have access to better job opportunities and have a valuable professional development. Therefore, educators are trained to be responsible for imparting such education in the foreign language. Money has also been invested in the training of this staff in English-speaking countries through

seminars and programs so that, immersed in the English-speaking environment they acquire teaching methods and techniques that can be applied in schools in our country. As the **Panamá Bilingue Program** has adopted the use of the SIOP® planning model, training abroad includes preparation in the use of this planning template.

The purpose of this research project is to evaluate the SIOP® model and its benefits in the process of teaching English language and the science subject.

CHAPTER I

GENERAL ASPECTS OF THE RESEARCH

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1.1 Problem Statement

1.1.1 Origins of the SIOP® Model.

Echevarría, Vogt and Short are the creators of the Sheltered Instruction Observation Protocol (SIOP®) lesson planning model. They developed this protocol in the United States, thinking about how to help teachers in their goal of teaching students to learn the language as such, in addition to academic content as a science. That is the branch that will occupy us in this research. This model arose from the need to teach English to non-native speakers in the United States (Echevarría & Short, Center for Research on Education, Diversity and Excellence, 1999). In contexts in which there are students who have to learn content in a language which is not their native language, it was necessary to innovate with strategies that encompass this type of environment in the school classrooms. The SIOP® model applies to the teaching of the English language in the linguistic-academic area but also for the teaching of specific subjects such as social sciences, mathematics and sciences (Echevarría, Short, & Vogt, Making Content Comprehensible for Secondary English Learners: The SIOP Model., 2004)

Research conducted on the SIOP® lesson planning model confirms that when teachers use the SIOP® model for their planning and for teaching English learners, high-quality, effective directives are delivered that improve student achievement (Echevarría, Short, & Vogt, Making Content Comprehensible for Secondary English Learners: The SIOP Model., 2004)

These authors have conducted research in different areas. Vogt, for example, has focused on the area of understanding, especially in content areas. They have concluded that teachers needed a guide for planning and implementing

high-quality assisted instruction for English learners and the SIOP® model is filling this need.

The SIOP® model or the SIOP® lesson planning is only a structure of thirty indicators grouped into eight categories that helps teachers to design and plan the educational practice: preparation, development of prior knowledge, comprehensible input, learning strategies, interaction, practical application and review-evaluation (Vogt & Echevarría, 2008). These categories must be developed for each class range from the objectives to the evaluation, which means that in a class period students must be evaluated. This process links each indicator to the other progressively. Recently, it was said in a conference that for several teachers, during preparation stage, the most important for the speaker is to know the students. He explained that in order to prepare his lesson, it is necessary to know students first. Once in the classroom, it is necessary to bring the students to the topic by linking any prior experience to the new lesson. It is valid also to create student's interest in the lesson. In that way, gradually, at the end of the class, teachers can be able to evaluate students' understanding before leaving the classroom. There is a step called wrap up in which students review the objectives and the teacher can be sure if during the class the goals were reached.

> One of the strengths of the SIOP® Model is that it provides a way for teachers to organize their instructional practices so that features of effective instruction are present in every lesson. The comprehensive nature of the model allows for teachers to include favored practices from their own repertoire but also reminds them of important features that may be overlooked. By following the model, lessons will include the features of instruction that we know benefit students, and teachers will implement the features systematically, providing high-quality instruction to their students (Echevarría & Short, Improving Education for English Learners: Research -Based Approaches, 2010).

> According to (Batt & Larenas Díaz, 2010) in their research about the SIOP® model and its applications in Chilean education, the SIOP® model (...): synthesizes the contributions of the theory of understandable teaching, of the models of

> classroom interaction, of the models of cognitive strategies and of the theory of contextualized teaching for second languages. The SIOP® model articulates these contributions in a flexible and open framework that organizes the pedagogical practices of the language teachers and the learning of the students. The SIOP® model is also a response to years of applied research with teachers, students and real classrooms, and, ultimately, a linguistic-pedagogical proposal for the socio-educational reality in Chile.

While in the United States and Chile the SIOP® model is accepted, Inceli from Turkey brings us closer by emphasizing that it was conceived to guide the teachers with the planning of the classes and to teach the lesson, in addition they focus on implementing the model in all the levels and content areas in a variety of geographical areas (Inceli, 2015).

According to the three previous opinions, it is important to mention that the SIOP® model has been executed and has been the object of study providing good results, at least in the United States, Chile and Turkey. This research will attempt to demonstrate its effectiveness by inquiring teachers at the official school in Veracruz.

1.1.2 The SIOP in Panama

Bilingual education in the official educational centers of Panamá began under the protection of law 2 of January 14, 2003. This law establishes the mandatory teaching of the English language in official and private schools of first and second level of education with the purpose of contributing to the modernization of Panamanian education. The law declares that learning and teaching the English language is of public interest (Gaceta Oficial Órgano del Estado, 2003).

But until the year 2017 the law 18 is created on May 10, 2017. This formalizes the creation of the **Panamá Bilingüe Program**. In its article 1, it establishes the primary objective of implementing the teaching of the English

language as a second language in the official educational centers of the Republic of Panamá. Its main purpose is providing students with the best tools of competitiveness that facilitates their insertion in the labor market. To fulfill the objective of the **Panamá Bilingüe Program**, the Ministry of Education will guarantee the training of Panamanian teachers that are required at a national level and its certification (Gaceta Oficial Digital N° 28275-B, 2017). The main components of the program are also declared, which include teacher training, increase of class hours in the general basic level within the regular schedule called **Kids Program** and the **After School Program** for Junior and High levels.

Panama as some countries in Latin America, improves English learning. Since 2004, Chile develops "English Opens Doors" Programa Inglés Abre Puertas (PIAP). The English Open Doors Program of the Ministry of Education, has the mission of "improving the level of English that students learn from 5th grade to 4th year, through the definition of national standards for learning English, a strategy for professional teacher development and support for English teachers in classrooms " This, according to Decree 81 (Ministerio de Educación, 2016)

The Language without Borders is a program developed in Brazil since 2014. This is a program aimed to students of higher education in this country from South America to increase their knowledge in English language.

> Idiomas sem Fronteiras, in Portuguese, was developed by the Brazilian Ministry of Education through the National Secretaria of Higher Education (SESu) in conjunction with the Coordination for the Improvement of Higher Education Personnel (CAPES). Language without Borders' main goal is to promote linguistic politics actions to internationalization of the Higher Education in Brazil, valuing the specialized degree of professors who teach foreign languages. It seeks to offer language courses and offer Brazilian students with opportunities of access to foreign universities in countries where higher education is taught fully or partially in a foreign language (SINTER-UFSC, 2019). This program looks like Panamá Bilingüe Program in the way it prepares students to apply for a carrier in countries

around the world. A long-term goal for Panamanians is to be prepared so students can be able to compete in better job opportunities.

As many other countries, Mexico also has developed a program focused on the importance of learning English.

> Proyecta 100,000 is a Mexican proposal that sets the goal of 100 thousand Mexican students going to study to the United States and 50 thousand U.S. students studying in Mexico by 2018. It also proposes the multiplication of binational research and innovation centers, language teaching, and the promotion of exchange opportunities (Secretaría de Relaciones Exteriores, 2019).

The largest economies in Latin America have programs to strengthen the teaching of a second language. Chile, Brazil, and Mexico point to the need of strengthen bilingual education in both children and adults on the basis of being at the forefront of the needs that the modern world demands.

Panama Bilingüe Program prepares teachers locally and internationally. The goal is to train a total of 10,000 teachers by 2019. These will impact a total of 300,000 students nationwide. At the local level, English teachers from the official education system should be trained in a 40-hour training denominated Back to the Basics. This training has as objectives to identify, evaluate, promote and develop competences in the participants through innovative teaching and learning strategies. Teachers graduated from the Juan Demóstenes Arosemena Higher Pedagogical Institute and students of English and teaching careers of local universities receive 240 hours of instruction and intensive training in the English language in the so-called Training Centers. Teachers also receive training abroad which provides them with new teaching methodologies through intensive English courses. Currently 32 universities in United States, United Kingdom, and Canada are part of the program. The training improves the skills of teachers and their performance in the classroom. This training abroad can last from 8 to 16 weeks depending on the profile of the participant.

Once promoted by the Ministry of Education, the **Panamá Bilingüe Program**, it was necessary to adopt a new education model to obtain the objectives proposed by the **Panamá Bilingüe Program.** It was the SIOP® lesson planning. But the SIOP® model was already familiar in our country. In 2010, when the **Access Program** was launched, sponsored by the government of the United States, led by Dr. Christine Palumbo in which 25 English teachers from different regions of Panamá were trained, the SIOP® model was first known. Later, in 2015, the model is taken up as a methodological structure of the **Panamá Bilingüe Program**. As the **Access Program** is a program for the teaching of the English language, Dr. Christine Palumbo chooses the SIOP® model as a linguistic-pedagogical model supported by various scientific researches, which allows the teacher to support a transition, centered on the teacher, to one focused on the student.

Because of its proven success, this linguistic-pedagogical model Sheltered Instruction Observation Protocol (SIOP®), was adopted by the **Panamá Bilingüe Program** as a valuable resource for the professional performance of Panamanian teachers. The SIOP® model, like any other model, is very flexible. This is used in **Panamá Bilingüe Program** to help teachers in the use of effective pedagogical practices that promote both language development and academic performance in students through integrated content and language learning (Science and English).

Researchers from the United States and Turkey (Inceli, 2015) have proven the SIOP® effectiveness and in Panama, through this research, it will be found out if it has the same results. It will be confirmed if the teachers who implement this model obtain better results than those who do not use it. The impact of the use of the SIOP® model on students through the reports provided by the teachers who apply it will be measured.

1.2 Research Problem

Due to the fact that in Panamanian official schools Science teachers use the SIOP model to plan their classes, though this research, the intention is to

evaluate this model in a primary school and it will be focused on inquiring teachers with the following questions:

- What are the benefits of the SIOP® model when Science is taught in English?
- What do teachers think about the usefulness of the SIOP® model when planning their classes with this model?

1.3 Justification

The purpose of education is to ensure that students achieve meaningful learning. The monotonous classes that are usually observed in some educational centers that consist of a traditional education leave very little benefit for the student's real life, limiting their creativity since they do not consider the different types of learning, multiple intelligences, or personalities of the students.

With the creation of the **Panamá Bilingüe Program**, this tool is adopted. As implemented by the Colombian American Center in Colombia (Salcedo, 2010), and as a subject of research by John Morales in a secondary school in the same country giving positive results (Morales, 2014). In Ecuador, meanwhile, Rizo & Matos (2013) explain how the elaboration of an integrated curriculum of the languages and non-linguistic subjects in the school takes advantage of the strategies and skills developed in a common language or topic to ease the learning of others. In order to make the contents understandable to students, techniques described in the SIOP® (Sheltered Instruction Operational Protocol) model developed by Jana Echevarria, Mary Ellen Vogt and Deborah J. Short (2008) are used, which includes the use of multiple didactic materials, texts for each student in English, workbooks, graphics, monolingual (English-English) and bilingual (English-Spanish) dictionaries, gestures, drawings, group work (Communicative Language Teaching), songs, and audiovisual materials. Thus, the inclusion of

graduates in the current plurilingual community is guaranteed, showing a competent bilingual performance that allows them an academic training in accordance with international standards (Rizo & Matos, 2013).

In the same way, according to some cases of studies developed by Pearson, the SIOP® has shown excellent results. In 2003, Brockton High School was a school where more than 50% of students speak a language other than English at home. Only 22% of students were able to pass the English language arts, and only 26% math when they were required to pass the Massachusetts Comprehensive Assessment. Because of its research-based approach, the Sheltered Instruction Observation Protocol was selected by this school. As a result, between 2003 and 2009, as Brockton High consistently implemented the SIOP® model, the percentage of ELs passing the English language arts (MCAS) improved dramatically, with a 255% increase in English language arts and a 158% increase in math (Pearson, n/a).

So it can be said that the SIOP® model has generated good results in its application in different countries around the world. It is of great interest that for the first time this model be evaluated in a Panamanian school. In this way, we can expose the results that we do not doubt are positive as they are shown in the studies described above.

1.4 Hypothesis

With the evaluation of the SIOP® model, it will be confirmed if there are benefits in the teaching process of the Science subject in second grade students of the Veracruz educational center.

1.5 Objectives

1.5.1 General objectives:

- To evaluate the use of the SIOP® model and its benefits in the teaching process of the Science subject in second grade students of Veracruz educational center.

1.5.2 Specific objectives:

- To identify SIOP® strategies used by teachers at Veracruz educational center.
- To inquire the second grade Science teachers about the usefulness of the SIOP® model and its benefits when planning classes.
- To determine the influence of the use of the SIOP® model in the second grade students of the Veracruz educational center.

CHAPTER 2
BACKGROUND AND LITERATURE REVIEW

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BACKGROUND AND LITERATURE REVIEW

2.1 Concept of the SIOP® model

There are several definitions of the SIOP® model, Three of them were collected for their relevance to this research since its meaning will be ample defined throughout the development of this study.

> SIOP®: The SIOP® Model, or the Sheltered Instruction Observation Protocol, is a framework for comprehensive academic interventions to increase students' academic language proficiency (Echevarría, Vogt, & Short, Making Content Comprehensible for English Learners: The SIOP Model, 4th Edition, 2013)

> The SIOP® Model is a lesson planning and delivery system that incorporates best practices for teaching academic English and provides teachers with a coherent approach for improving the achievement of their students (Himmel, Richards, Echevarria, & Short, 2009)

> SIOP® Sheltered Instruction Observation Protocol, was created as a means of helping teachers to meet the needs of English language learners (ELLs) in the content area classroom. It is now used to help teachers plan, teach, and reflect on a content-based lesson with a language and literacy focus (Kongsvik, 2018).

This model, according to its authors, can be used to teach languages as well as to teach content. In Panama, the SIOP® model is used to teach English as well as to teach science content.

2.2 Review of the SIOP® model

Like any successful project, it can be exalted how this model, that began in the United States, has been adopted by many countries around the world. In many articles that involve the SIOP®, the importance of its origin is mentioned since it was created thinking about how to adapt the classes in the different multicultural classrooms in which the existence of students with little or no knowledge of the English language predominated. We value what Leonardo Herrera summarizes in his article "Teaching Language Teaching Based on Five Components" (A Five-Feature Language Teaching Proposal).

> SIOP® Model began as an instructional alternative to help the population with limited English proficiency (LEP) in the United States meet high academic standards established in new educational initiatives. The NO Child Left Behind (NCLB) is one of those initiatives that poses serious academic challenges for the LEP population (Limited English Proficiency) Limited English Proficiency of rapid growth. SIOP® stands for Protected Instruction Observation Protocol, a research instrument designed to evaluate the use of specific instruction techniques in the classroom. Teachers were expected to implement these techniques in order to help LEP develop both their linguistics and language. A proposal of teaching languages with five characteristic academic skills. Therefore, the LEP could match the academic level of native English speakers (Herrera, 2013).

After some researches carried out in California, the authors concluded that if students are designated English learners, they are by definition not proficient in English, yet we test them primarily through that language. Second language acquisition is a long-term process. Research has shown that beginning English learners need four to seven years of instruction in order to reach the average performance level of their English-speaking peers (Collier, 1987) (Cummins, 2006); Lindholm-Leary and Borsato (2006); Thomas and Collier (2002). Furthermore, the relationship between literacy proficiency and academic

achievement grows stronger as grade levels rise—regardless of individual student characteristics (Echevarría & Short, Improving Education for English Learners: Research -Based Approaches, 2010).

From a pedagogical perspective, reading and writing are the essential means for the acquisition and mastery of academic language in bilingual children, therefore, the academic content must be integrated into the teaching of the language. Likewise, "teaching in a bilingual program (or only in English) must pay special attention to the meaning, the language and the use in both languages" (Cummins J. , 2002)

The use of the SIOP® model mostly used in the United States shows some similarities and differences to its use in our country. In USA, as in Panama, the students speak another language. But that language is spoken by the teachers. So if necessary (almost it always is and it is done) the teacher can translate the content in some degree. In the same way, if the student does not understand something, he/she will be understood in his native language and with confidence he will make himself understood. However, teachers from the United States do not understand the language of students who speak other languages. In this sense, I consider the difficulty of teachers in the USA. However, students have the cultural context which is a great contribution to learn the language. It has been very well thought to have this model to make the class more attractive and understandable for foreign language students. Teachers have the challenge of understanding and getting the student to understand the content while acquiring English vocabulary. After reading several books, articles and publications, a lot has been learned about the different strategies that teachers have developed adapting them to the SIOP® model, achieving great advances in their students. Reading the description of the art class in kindergarten and the science class of a teenager shows that step by step the structure of SIOP® has had a great impact on the education of non-English speaking students.

2.3 Features of the SIOP® model

The SIOP® components definitions have been extracted from the book 99 ideas and activities to teach Young learners the English language with the SIOP® model (Vogt & Echevarría, 2008).

1. Preparation: teachers write content and language objectives clearly to students, also choose appropriate content for age and educational background level of students. The use of meaningful materials and plan meaningful activities.
2. Building Background: teachers link concepts to students' background and experiences, past-prior knowledge and emphasizes in key vocabulary.
3. Comprehensible Input: teachers use appropriate speech for students' level, explain academic tasks clearly and use a variety of techniques like modeling, visuals, hands-on activities, demonstrations, gestures, and body language.
4. Strategies: teachers provide ample opportunities for students to use strategies by problem solving, predicting, organizing, summarizing. Also, the use of scaffolding is consistently, moreover, the use of question that promote higher-order thinking skills.
5. Interaction: teachers provide opportunities for interaction and discussion between teacher/student and among students. The use of group configurations to support language and content objectives of the lesson plus waiting time for students to response and time to clarify key concepts in L1 when needed.
6. Practice and Application: teachers provide hands-on materials to practice using content knowledge. Activities for students to apply knowledge in the classroom and integration of activities by using the 4 skills (reading, writing, listening, and speaking).
7. Lesson Delivery: teachers support content and language objectives clearly and engage students approximately 90-100% of the learning period.

8. Review and Assessment: teachers give a comprehensive review of vocabulary and key content concepts. Provide feedback for students regularly in their output and conduct assessment of students' comprehension and learning throughout lesson on all lesson objectives (e.g. checking, group responses).

2.3.1 The Preparation component includes these features:

+ Content objectives clearly defined for students.
+ Language objectives clearly defined for students.
+ Content concepts appropriated for age and educational background level of students.
+ Supplementary materials used to a high degree, making the lesson clear and meaningful.
+ Adaptation of content (text and assignment) for all levels of student proficiency.
+ Meaningful activities that integrate lesson concepts (interviews, simulations, models) with language practice opportunities for reading, writing, listening, and/or speaking.

In component one, Content and Language objectives guide both teaching and learning in a classroom. Content and Language objectives are the foundation of a lesson. Furthermore, the authors of the SIOP® model suggest they should be written in kid-friendly language and posted to be reviewed with the students during the class. Teachers can also create Specific, Measurable, Achievable, Realistic, and Time-Bound (SMART) objectives. Besides, supplementary materials should be considered; for example hands-on materials, real-life objects, pictures, graphs,

charts, video clips, demonstrations, modeling, and adapted text. Finally, the vocabulary list has to be chosen according to students' level and language proficiency.

2.3.2 Building Background is the second component and it seems to be one of the most important steps while teaching. It challenges teachers to engage students 90-100% of the time.

There have been studies related to this significant point where every person can relate previous knowledge to the new learning. This point seems to be well considered for creating interest in students for new lessons. So we have that:

> Cognitive psychologists have described how learners develop understanding through connections they make among those things they know and have experienced, and those things they are learning. Researchers support teachers' explicit activation of students' prior knowledge, and the building of background for those students who may lack prior knowledge of a particular content topic. These linkages of "schemata" helps us all learn new information by helping us connect what we know and experience what we are learning (Vogt & Echevarría, 2008, p.23). In these stage of class, teacher might be familiar with phrases like *teacher you know, last time we went to the park…,* or *teacher: can I tell you something?,* and in a couple of minutes teachers have a class of story-telling. However, it is not bad at all, a SIOP®-user will know that kids are familiar with the topic and he/she can use these stories to link a new knowledge in his/her students.

Teachers must consider that students go to school with different experiences. Some of them may not have any. When teachers use building background step in class, students activate prior knowledge and at the same time, build background. Teachers can refer to any lesson previously taught in order to make a substantial connection to the new learning.

The Building Background component includes the following features:

- Concepts explicitly linked to students' background knowledge.
- Links explicitly made between prior learning and new concepts.
- Key vocabulary emphasized (e.g., introduced, written, repeated, and highlighted for students to see).

2.3.3 Comprehensible Input is basically to help students understand not only the lesson but instructions. It may include everything supports students understanding. Vogt and Echevarría (2008) say teacher may speak loudly, but students may not understand what he/she is saying. It is necessary to speak at an appropriate pace (not so fast, not too slow) enunciate clearly, and use gestures and body language, when appropriate, to reinforce specific points. Also, clear explanations and modeling are going to be very helpful for learners. Students may need demonstrations, photos, illustrations and models to make sense to the word said or written. If students clearly understand what they have to do, they will be more successful in completing activities and tasks.

The Comprehensible Input includes these features:

- Speech appropriate for students proficiency levels (e.g., slower rate, enunciation, and simple sentence for beginners).
- Clear explanation of academic tasks.
- A variety of techniques to make concepts clear (e.g., modeling, visuals, hands-on activities, demonstrations, gestures, body language) (Vogt & Echevarría, 2008).

2.3.4. Strategies component purpose is to examine strategy instruction. And it is to support students to make connections, solve problems, and monitor students' own learning. Moreover, Kongsvik, J. (April 10, 2018) highlights the importance of consciously teaching learning strategies, challenging students' thinking skills, and focusing on scaffolding as a means of setting the students up for success.

Retrieve from https://sioptrainer.blogspot.com/2018/04/siop-strategies-and-scaffolding.html

The Strategies component focuses on the cognitive and metacognitive strategies that learners use to make sense of new information and concepts. It helps students become more strategic in their thinking and learning. Vogt & Echevarría (2008). Science is a subject that allows putting in practice strategies component all the time. Scaffolding support gradually releases as students begin independent in applying new learning. In teaching science, it is much appropriate the use of graphic organizers, adapted text, partially completed outlines, and text with key concepts and vocabulary marked with a highlighter. But teachers also can scaffold verbally. Some techniques are think-aloud, vocabulary, paraphrasing, and repetition.

The Strategies component includes the following features:

+ Provide ample opportunities for students to use learning strategies (e.g. problem-solving, predicting, organizing, summarizing, categorizing, evaluating, and self-monitoring).
+ Use scaffolding techniques consistently throughout the lesson. Assisting and supporting students understanding (e.g., think-alouds).
+ Use a variety of questions types including those that promote higher-order thinking skills throughout (e.g., literal, analytical, and interpretative questions) (Vogt & Echevarría, 2008).

2.3.5 Interaction Component is clearly explained in an adaptation from the book (Echevarría, Vogt, & Short , Making Content Comprehensible for Secondary English Learners: The SIOP Model, 2010).

> English language learners benefit from opportunities to use English in multiple settings across content areas. Learning is certainly more effective when students have an opportunity to participate fully, actively discussing ideas and information. Instead of teachers talking and students listening, sheltered content classes should be conducted in a way that allows students to interact in their collaborative exploration of the content. Through meaningful interaction, students can practice speaking and making themselves understood by asking and answering questions, negotiating meaning, clarifying ideas, and other techniques.

It makes sense that during the class, students have time to develop and practice the new learning. Learning a new language involves four skills, that is why during interaction learners can stress-free exchange their knowledge. Also, talking with others, either in pairs or small groups, allow for oral rehearsal of learning. It may need teachers to encourage students to talk. Teacher can ask them for more elaborated answers, like “what do you mean by…?”, “how do you know?”, “tell me more about it”.

Some activities for cooperative learning are Information Gap Activities; each student has a piece of the information to solve a problem, Jigsaw; each student has a chunk of the reading, Four Corners, Roundtable, 3 Steps Interview; in pairs, each student listens to his/her partner for 3 minutes.

The Interaction Component includes these features:

- Frequent opportunities for interaction and discussion between teacher and student and among students, which encourage elaborated responses about lesson concepts.
- Grouping configurations support language and content objectives of the lesson.
- Sufficient wait time for student responses consistently provides
- Ample opportunities for students to clarify concepts (Vogt & Echevarría, 2008).

2.3.6 Practice and Application component is the opportunity students have to practice and apply what they are learning. There are two main reasons for leaving students several hands-on and manipulative materials to allow students apply the content and language objectives: 1) students are more likely to retain new information if they immediately put it to use, and 2) the teacher can assess students' learning while they are practicing and applying their new understanding (Echevarría, et all, 2008) because students make these connections from abstract to concrete concepts more effectively when they are engaged in activities that integrate the four language skills (listening, speaking, reading and writing). Therefore, it is teacher responsibility to help students apply new understanding by activities like In the Loop; this activity includes a piece of paper and cereal that can be eaten. Each student is given a question or a challenge like math problem to solve, Bingo, Are you sleeping? this is for summarizing eight phrases about the lesson that fits the melody. The lyrics can be written on charts. Another activity that fits to Practice and application is creating graphics for expository texts. Some examples taken from Pearson are Explanation: Main Idea and Supporting Details,

Cause and Effect, Compare and Contrast, and Description; where is centered a topic, surrounded by several characteristics.

The Practice and Application component includes the following features:

- Hands-on materials and/or manipulatives provided for students to practice using new content knowledge.
- Activities provided for students to apply content and language knowledge in the classroom.
- Activities integrate all language skills (listening, speaking, reading and writing) (Vogt & Echevarría, 2008).

2.3.7 Lesson Delivery is SIOP® seven component. It is completely based on content and language objectives. It includes how well the stated content and language objectives are supported during the lesson, to what extent students are engaged in the lesson.

Para (Vogt & Echevarría, 2008),

> It also includes how appropriate the pace of the lesson is to students' abilities. Teachers must consider students with special needs. The research relating to involve time on task states that instruction that is understandable to ELLs, that creates opportunities to talk about the lesson's concepts, and that provides hands-on activities to reinforce learning, captures students' attention and keeps them more actively engaged.

By creating meaningful activities, students will be more interested and engaged in the class. While more time learners are engaged, better learning they will acquire. It also should be considered appropriate pacing for students meet the objectives.

Two activities for Lesson Delivery we found very useful are Magic Buttons and Secret answer. Magic Buttons allows students think-time during the lesson. Each student is given a two buttons: an “I am thinking” button and “I got it!” button. The teacher poses a question for students to answer when they are ready.

Secret answer consists in answering to a particular question by showing a hand signal close to their chest, this way avoids students copy the answers from partners. On the teacher’s cue (“Show me!”) students show with their fingers the number of the option that correctly answer the question.

Lesson Delivery component includes the following features:

+ Content objectives clearly supported by lesson delivery.
+ Language objective clearly supported by lesson delivery.
+ Students engaged approximately 90% to 100% of the period.
+ Pacing of the lesson appropriate to the students’ ability level (Vogt & Echevarría, 2008).

2.3.8 Review and Assessment component**.** It is the last SIOP® component, but Review and Assessment is not done only at the end of the lesson. Throughout the lesson, and especially at the end, teachers can determine if students have learned main concepts of the lesson and if they have retained the key vocabulary. It is considered important to review the vocabulary during the lesson to be sure if it is appropriate to move on or if it is necessary to reteach in order to support effective

assessment and instruction. Making feedback, teachers can support lessons and review key vocabulary in order to make decision according to students' responses.

Review and Assessment component considers important to review the key vocabulary, review the key content concepts, and assess the lesson objectives. It is valid to mention that Assess mean to gather and synthesize the information that concerns students learning. Evaluation means making judgements about students learning. Assessment comes before evaluation.

The Review and Assessment component includes the following features:

+ Comprehensible review of key vocabulary.
+ Comprehensible review of key content concepts.
+ Regular feedback provided to students on their output (e.g., language, content, work) Assessment of student comprehension and learning of all lesson objectives (e.g., spot checking, group response) throughout the lesson (Vogt & Echevarría, 2008).

2.4 The SIOP model in Science teaching in our schools.

Teaching science should be fun and rewarding for both teachers and students. Children have an innate curiosity about everything that surrounds them. Children wonder how plants grow, how fish live in water, why it rains, why the moon shines, why little sticks float and how they are going downstream. Therefore, to satisfy the children's curiosity, teachers must prepare themselves to face this challenge by creating an environment that envelops students in an experience that keeps children focused on the subject and enthusiastic in satisfying their curiosity in a pleasant classroom. Science class can include poems, concept maps, drawing activities, reading, writing a paragraph, observations, and several experiments to

record data, graph, or create a weather station and talk about it, all kind of activities that allow students with different skills understand any topic in a creative way.

In Panama, science has been taught in English for at least five years. Initially, this subject was aimed at children of first, second and third grade of elementary school. For educators of the English language it was a challenge, since the student population is Spanish speaking and in some cases only speakers of aboriginal languages. Added to this, in a classroom we can find students with special educational needs, so it is a challenge to serve each student in groups of up to thirty-five children full of curiosity. But the English and Science teachers are preparing themselves for this task. They are sent abroad to reinforce their knowledge and the Ministry of Education strives to give seminars and workshops specialized in the teaching of English language, contents in English and specific strategies for the diversity of students.

The teachers have even been specialized in the use of the SIOP® model tool to better plan each of their classes and to help themselves to be more specific in each of the contents, covering the five skills that a child must acquire while learning a foreign language: Listening, Speaking, Reading, and Writing.

To create a creative learning environment that helps students with their curiosities, especially in classrooms with students from diverse cultures, science teachers rely on the SIOP® model. Let's look at the elements of this model that have exceeded expectations in the planning of classes for the science subject.

> By using the SIOP® Model to plan and deliver science lessons, teachers can better meet the unique linguistic and academic needs of their students learning English. Drawing from the middle school science curricular units that we created for the National Center for Research on the Educational Achievement and Teaching of English Language Learners (CREATE), we will highlight key features of the SIOP® Model illustrate ways in which teachers can support English language learners' academic English development and acquisition of science concepts (Himmel, Richards, Echevarria, & Short, 2009).

> In their article Using the SIOP® Model to Improve Middle School Science Instruction (Himmel, Richards, Echevarria, & Short, 2009), the authors mention that a central feature of the SIOP® model is the inclusion of content and language objectives for every lesson. Content objectives identify what students will learn and be able to do in the lesson, and language objectives address the aspects of academic language that will be developed or reinforced. These objectives should be stated in clear and simple language and posted for the students to see. They should be read aloud at the beginning of the lesson so that both teacher and students understand the lesson's purpose, and reviewed at the end of the lesson to determine whether the objectives were met.

Based on the prior quote, it can be said that in several observations in the school, teachers were seen writing and explaining to their students the topic and each of the language objectives in order to make students know what they were supposed to learn at the end of the class. In this way students also started talking in their own language about the topic, then the teachers after introducing the topic, begin drawing something in the whiteboard related to the lesson to be sure all students are understanding what was it going to be about, at the same time teachers are saying in English all those words students mentioned in Spanish. Then, as a class, they are building the key words list.

Related to the objectives, Nazan and Castañeda (2011) suggest some planning strategies. 1. Know English Language Learners (ELLs) language-proficiency levels. Teacher must first know students' language-proficiency levels to identify appropriate content objectives, modify instruction, make accommodations, and adapt assessments. A teacher is no supposed to create objectives without thinking in his/her students level of proficiency. 2. Align content and language objectives. One way science teachers can assist ELLs is to provide explicit language objectives aligned with content objectives. Language objectives focus on the specific vocabulary, grammatical, rhetorical, and speech structures needed to learn science content. (Nazan & Castañeda, 2011). It means that students may need some grammar structure to comprehend a science lesson. So

while students learn science content, they apply foreign language rules. In addition, students with low level of language have in this class the opportunity to clarify doubts about the use of the English language perhaps with a little more interest since they need it to complete tasks in science.

2.4.1 Higher Order Thinking Skills

When science is taught through the process of questions, scientific knowledge is not considered as a collection of facts as steps to follow type recipe. Science is a way of thinking, reasoning, and making meanings of essential experiences (Tassell, 2001). In science, the use of questions by students plays an important role in their nature of information and in their learning, but students need to be encouraged in their discovery.

Many teachers use the question method to help students advance their discoveries and learning. The SIOP® model considers this fact and shows its importance by including in the form a line specifically for this. The Higher Order Thinking Questions or Higher Order Thinking Skills (HOTS) are questions that students cannot answer just by reading information. These questions require the student to apply, analyze and evaluate the information. For example, to conclude about an event after an observation in an experiment, to use old ideas to create new ones using information from different sources, or to explain reasons based on judgments, compare or contrast information.

Vygotsky says that "learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological functions" (Vygotsky, 1978). This is where it is worth highlighting the critical thinking questions that the SIOP® model authors include in this format. This is a section of importance both for the teacher who, before presenting a class, has to propose this previously analyzed question that can be completed by the level of

knowledge of their students, and for the students who will feel encouraged concentrating on the class and who know the purpose of the study of the lesson.

This question of critical thinking considers that the students can know or learn from the teacher but they can also inquire and know for themselves since they will be focused on answering the concern presented by the teacher in the question of critical thinking. Science is a subject that facilitates in a very special way the development of critical thinking in students by the nature of their contents.

HOTS is well considered by teachers because it supports ELLs understanding. Teacher can promote HOTS to his/her students through strategies that develop metacognitive (thinking about thinking), Cognitive (active learning), and Social /Affective (interactive learning). For all components, the teacher has a key role in explaining; modelling and creating an atmosphere which encourages reflective discourse (Asta Haukas, 2018) promoting different strategies for students to develop the thinking skill, work on it and, share it. The same way “I do, We do, and You do” works in modeling.

According to Watson (2019) Higher Order Thinking Skills (HOTS) distinguishes critical thinking skills from low-order learning outcomes, such as those attained by rote memorization to higher-order thinking which requires understanding and applying knowledge. It is based on various taxonomies of learning, particularly the one created by Benjamin Bloom in his 1956 book, "Taxonomy of Educational Objectives: The Classification of Educational Goals". Higher-order thinking skills are reflected by the top three levels in Bloom’s Taxonomy: analysis, synthesis, and evaluation. HOTS include synthesizing, analyzing, reasoning, comprehending, application, and evaluation. Those six levels were later revised as remembering, understanding, applying, analyzing, revising, and creating.

Then, we have that in remembering, students are able to recognize and recall facts. In understanding, they understand what each fact means. Then, students will be able to apply the facts, rules, concepts and ideas. When students

can analyze, they break down information into component parts. In evaluation step, learners can judge the value of information or ideas. Finally, they can create by combining parts to make a new whole.

2.4.2 Challenges at elementary schools

While building background prepares students to be engaged to the topic that is taught but in an unconscious way, it explicitly intensifies concepts by knowing the students' background and experiences. Also, past learning with new concepts and finally, emphasizes in key vocabulary (e.g., introducing words, writing, repetition, and highlighting) for students. Bautista & Castañeda highlight the importance of this step that they suggest is crucial for ELLs. They benefit when the teacher activates their prior knowledge of a science concept and builds on it. Because it enhances new learning, influences performance, and improves comprehension for all of them.

In their book Make the Content understandable for Secondary English Learners by the SIOP® Model, the authors of the SIOP® model begin their work by describing the difficulties of a low level student in the English language proficiency. They agree that the foundation of academic success lies in elementary schools and that if high school students are not able to read to learn, they will face significant academic challenges in high schools. They also present some statistics that show that the majority of Hispanic students do not reach an appropriate level to attend a secondary school. On the other hand, a program implemented in the year 2001 called No Child Left Behind has been an increase of young people who fail to graduate because they do not pass the exams despite having completed other requirements (Echevarría, Vogt, & Short, Making Content Comprehensible for Secondary English Learners The SIOP Model, 2010).

Although the reality is a bit different since in Panama English is taught as a second language, the aim is to rescue the authors comment about the fact that the

basis of academic success is in primary education. The **Panama Bilingual Program** involves Kindergarten students thinking precisely about this important stage of children's development. Science is taught to students from this level as well. The contents are adapted to the level of understanding of the students making it understandable, based on key concepts, supported by illustrations and spaces for drawings that help kids to contextualize the information.

Education by itself requires a lot of patience and strategies to leave a positive impact on the student. Teaching a foreign language is a challenge. The correct use of tools to facilitate learning in students can make the difference between learning and meaningful learning. The environment in which classes are developed is another influential factor in learning. However, we believe that the difference between the acquisition of meaningful knowledge and the brief learning can be found in the hands of teachers and their strategies.

> Talking about strategies, as this research was developed, the effectiveness of the SIOP® planning mode could be verified. It is believed that it may be necessary to adapt the use of this to the conditions of the students and the school environment. The increase of strategies and the wide use of real materials in context, activities with clear purposes and appropriate mechanisms designed for students are the components that make the difference between the most profitable operations of the SIOP® planning model.

Obviously, it is equally important to check that the objectives of each class are very clear, achievable and measurable. If these requirements are not met, the rest of the components of the SIOP® may not be according to what the students must learn with each class or lesson. From there may arise some situations that do not make effective content learning and may result that the concepts are not well understood or in due time. Teachers who use the SIOP® model achieve a better management of the class, better organize time with their students and achieve a better learning of science content in their students. The correct use of

the SIOP® model applied in science is very beneficial for both children and teachers and contributes significantly to the learning of the English language.

There are other challenges to face at elementary schools. The lack of routines in classrooms is something that may be solved in a few classes. First, students should be aware of this and participate of the developing of routines to follow each class. SIOP® is a good way to organize the class. It is a guide for teachers to develop lessons step by step. Making students know step the class is being completed may be helpful for teachers who teach low levels. Small kids love routines. For example, a teacher can say “Well students, let’s read our objectives” then he/she will continue “to reach our objectives, we will use the following materials”, at this point, students will be more interested in that step of the class when they will be expected to use a hand-lens or a thermometer. Next, the teacher could say “in order to understand what we have to do, we will talk about some tools and learn what are they used for”. Using drawings or real tools, the teacher can ask students the name of each tool and what they already know about it. If necessary, teacher give more details about them.

Making it as a routine, kids will be involved in the topic and will be willing to participate of each step of the class. They might be aware of their favorite stage and they unconsciously will feel that to achieve their favorite part they should participate in the other stages, so they will show good behavior and dedication during the rest of the class. At the end, a wrap up should be done, always, so that they get used to that in each lesson there is a review of everything learned.

In the previous description, it could be seen how the SIOP® through its structure is very functional to create a routine in class that at the same time promotes learning and guarantees the interest of the student. We can mention that the objectives were shared, vocabulary was practiced, realia was used, there was student participation, possibly they used tools in a group, there was interaction, the function of each tool was put into practice and a wrap up was carried out. All these are components of the SIOP® model.

At this point the anxiety levels of the students have been lowered and the teacher could be more relaxed. But we can improve much more if the position in which the students are located is changed. You can make groups, a single circle, make them stand up to observe the sky through the window, to describe the weather or to observe the noise of an airplane passing over the school. Simply listening to the birds that sing outside of the classroom can lower stress levels in children. Even a lullaby can be sung very slowly while they organize their things, this is a very subtle way of requesting silence. But as it was mentioned earlier, they are routines that with the passing of days the children will learn to follow and then they will become the norms of the group. Later it will be seen how discipline improves.

Teachers are aware of the diversity in Panama's official schools. Every day more students with special conditions are integrated into the educational centers. This requires that teachers prepare themselves to address this diversity. Initially, information about the condition of the student should be sought, along with the special education teacher, the contents that the student can complete should be adapted. Some learners are very proficient of learning quickly, but others require extra help. It is recommended relying on parents. The help at home will be reflected in their participation in class. We remind that the SIOP® can be adjusted to the students' level of understanding of the language, therefore, making use of this advantage guarantees that all the learners achieve an objective based on the lesson.

This country has a tropical climate. Although it can be very advantageous in many ways, changes in temperature affect the health of children. It is very common the absence of children to classes for diseases such as influenza, common cold, conjunctivitis and other gastrointestinal diseases. The absence to classes for these diseases is more frequent in children of lower grades. Knowing that at early ages is when children acquire better language learning, it is worrisome that they have this limitation. Though, there is not much that can be done in their

absence other than allowing them to work the contents of the books at home. However, for the most part, parents do not have English proficiency so kids do not receive the guidance they need to understand concepts. Their learning is based on vocabulary. Vocabulary is one of the subcomponents of the SIOP model, but the presence of the student in the school is required so that by interacting and putting knowledge into practice, he achieves greater learning.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

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RESEARCH DESIGN AND METHODOLOGY

3.1 Methodological Procedures

This section will show the description of the methods that have been used to collect and analyze data. Then, the research questions that were mentioned earlier in the first chapter will be answered. According to the problem posed, and depending on its objectives, this research will be qualitative and quantitative. Based on the experience and preparation of the teachers, it was possible to understand the degree of knowledge and their experience in the use and management of the SIOP® model in the school object of this study. Within the questions that lead to the evaluation of the model, that is closed survey, the following questions were asked: How often do you allow students to interact in science class? Being the interaction one of the components of the SIOP® model, it is believed that the question is very valid since students make group assignments and they are allowed to share ideas with their classmates. This is considered a great contribution for most of the students but much more for shy students because it helps them to relate to their classmates and to socialize while learning among them.

Another question that was included in this survey is related to the use of real objects in science class. It is proven that realia has a great impact on children. This leads them to develop their interest in the subject. Students develop their potential when they are allowed to manipulate real objects that the teacher brings to the classroom. The results of this question validates the question in the research problem. If the teacher uses realia in his/her classes, he/she is complying with the recommendations of the SIOP® model, which reflects the benefit for the students, thus fulfilling the central theme of this study.

This survey is aimed to Science and English teachers who uses the SIOP® lesson planning.

3.2 Type of Research

This research, which involves Science and English teachers, aims to obtain explanations about the use and effectiveness of the SIOP® model. It will give guidance in order to see if non-English speaking students can acquire vocabulary and learn Science concepts mainly. Through this mix-type qualitative and quantitative research, using a survey and questionnaire, the SIOP® model and its effects on students' learning process will be evaluated.

3.3 Population and sampling

3.3.1 Participants

Fourteen English teachers work at Centro Educativo Veracruz. Twelve of them teach English as a second language and two teach science in English. In relation to the years of experience as teachers, although some have several years teaching, they have the same period as the youngest ones in knowing and using the SIOP® model. Science teachers have two years of experience teaching first, second and third grade students. It is the same time of experience in working with the SIOP® model. They feel satisfied with their work using the SIOP® model for planning their lessons. All teachers have been trained on at least two times to better understand and use the SIOP model.

3.3.2 Sampling.

At the beginning, it was decided to survey science teachers of Centro Educativo Veracruz since this study is focused on the specific content of sciences while using the SIOP® model. However, once the curriculum of English teachers was reviewed, the variety of content that are part of science was determined. So without hesitation, all the English teachers were included since they implement their planning in the SIOP® format. With the support of the school principal, it was possible to conduct the surveys within the school.

The random sample by conglomerate will be the fourteen English teachers. The questions are directly related to the use of the SIOP® model to check its usefulness and effectiveness. The main interest was placed in the benefit that students receive when learning English. But it involves other pedagogy areas that arise, for example, if the teacher attends the classroom with properly structured planning, complementing activities for the students, these will be during the period of classes involved in the subject. Enough activities for students to complete, will keep them busy, without time to mess up or disturb their peers, which is reduced in good use of time and better group management. So answers can provide indicators of activity use, student skills, time management and group control as well.

3.4 Instrumentation (see appendixes 2 and 3)

This research work is based on a survey and a questionnaire that will be completed by the English and science teachers of Centro Educativo Veracruz. A closed survey was chosen with the purpose of attaining information that allows us to evaluate the functionality of the SIOP® model and the benefits in the teaching and learning processes of the students. In the same way, in the 10-questions questionnaire the participants are given the opportunity to express themselves related to the SIOP® model in an open way.

In an electronic link, the survey comprises fifteen questions that will provide information that will be analyzed in graphs. The data can express the level of acceptance and functionality of the SIOP® model. The data will also help to obtain information to corroborate the thesis. The SIOP® planning model is a tool that provides teachers with a very effective way to teach the English language in official elementary schools. The good use of this tool turns monotonous classes into a fun and dynamic way to teach and learn. With the answers gotten from teachers, frequency of use, activities, and most used strategies, among others will be measured.

With the questionnaire, it will be possible to get the participants to provide information about the key factors considered to prepare the lesson, the most significant activities and how they provide the target language practice, if they are allowed to work in groups and the main problems they face in the classroom.

3.4.1 Procedure

Guidance was received to create an online survey, so that participants felt free to complete it at any time they decided and using any electronic tool, be it a smart phone, tablet, computer or laptop. Some were very kind in giving their comments verbally, so notes of the conversations could be taken. Others, however, completed the survey and the questions at face value, leaving their reality reflected in their answers.

CHAPTER 4
INTERVENTION PROPOSAL

CHAPTER 4

INTERVENTION PROPOSAL

4.1. Organizational Feasibility**:**

There are coordinators, supervisors, who attend to the direct needs that can be presented to educators in schools. Hence, it is considered that the organization is feasible for the SIOP® model to be developed in the official educational centers so that in this way the objectives indicated in the evaluation of the SIOP® are obtained.

The organizational factor is NOT limited. The responses of the interviewees show that there is constant supervision and support from the staff in charge of monitoring the proper use of the SIOP® model at Centro Educativo Veracruz. This staff is also responsible for coordinating the training of new teachers and promoting meetings between teachers to discuss concerns and improve the use of this tool and other aspects of bilingual education in this primary school.

4.2. Human Feasibility**:**

To achieve the objectives set out in the proposal, it is necessary to have professional and trained personnel who must express their interest in consolidating the aspects related to the response times of the proposal. Although a minimum percentage of the **Panamá Bilingüe Program** educators does not have a university academic level, the program invests in their constant preparation and training to achieve the proposed objectives. Then, it can be said that the human feasibility of the proposal is not an impediment to achieve the objectives of the proposal. However, it is well-known it requires personnel disposition to participate in seminar meetings and courses to keep involved in new teaching trends.

4.3. Economic Feasibility:

The **Panamá Bilingüe Program** was proposed as an initiative of the national government of Panamá. It was suggested to teach English and Science to students from preschool level in all official schools. It does not require large investments or disbursements of money since the economic basis for the implementation, application and development of the SIOP® model is a program proposed and developed by the national government. But it can be emphasized that teachers require much more than training and intellectual preparation. They said it is necessary to complement classrooms well equipped with air conditioning equipment, good lighting, audio and visual equipment, computer classrooms with software so that students have the experience of working in modern conditions that make their learning unforgettable.

CHAPTER 5

ANALYSIS AND INTERPRETATION OF RESULTS

CHAPTER 5

ANALYSIS AND INTERPRETATION OF RESULTS

This chapter contains the most relevant results and analysis obtained from the application of instruments to English teachers at Centro Educativo Veracruz. In the first instance, general information of the participants is presented. Then, tables and graphs showed reflect the information directly related to the use of the SIOP® model through the teachers surveyed.

The SIOP® model is a format with eight components and thirty subcomponents that specifically describe its function and how it works. As it was mentioned earlier, the SIOP® model is a framework that guides the teacher and helps the development of the classes, but the most important thing is that the use of the SIOP® supports and facilitates students' learning. Through this research, using the interview, the effectiveness of the SIOP® model will be measured.

Each respondent had the chance to complete the survey through a link and could answer the questionnaire in a written form or orally. In that case, the information were recorded in a device and lately reviewed to collect information. It was also a proper moment to inquire teachers about their thoughts related to the program **Panamá Bilingüe**, the staff, and how they felt as part of the Program.

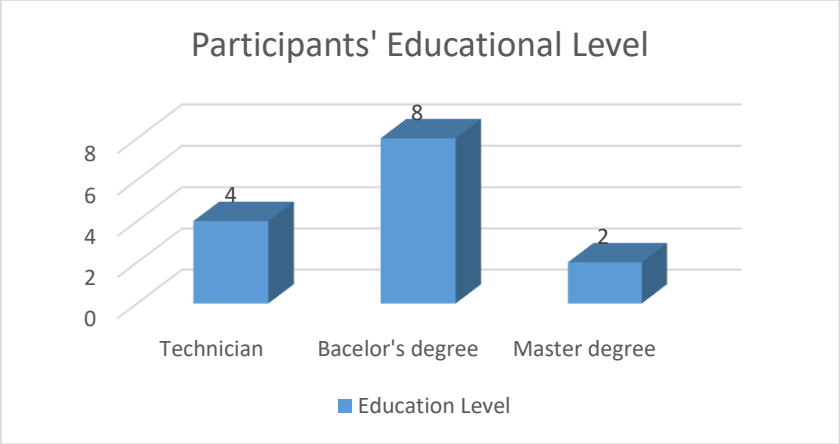
5.1. Quantity of teachers that participated in the survey and their education level.

The following two charts are based on teachers' general information questions.

Table 1. Quantity of teachers that participated in the survey and their educational level.

	Educational Level		
TOTAL	Technician	Bachelor's degree	Master's degree
14	4	8	2
100%	28%	57%	14%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 1. Participants' educational level.

This table shows teachers' responses to the question related to their educational level. Fourteen teachers from Centro Educativo Veracruz completed our survey. We considered important to know teachers' educational level because the more prepared the teacher is, the better his/her performance in the classroom has to be and, therefore, his/her students will be better served.

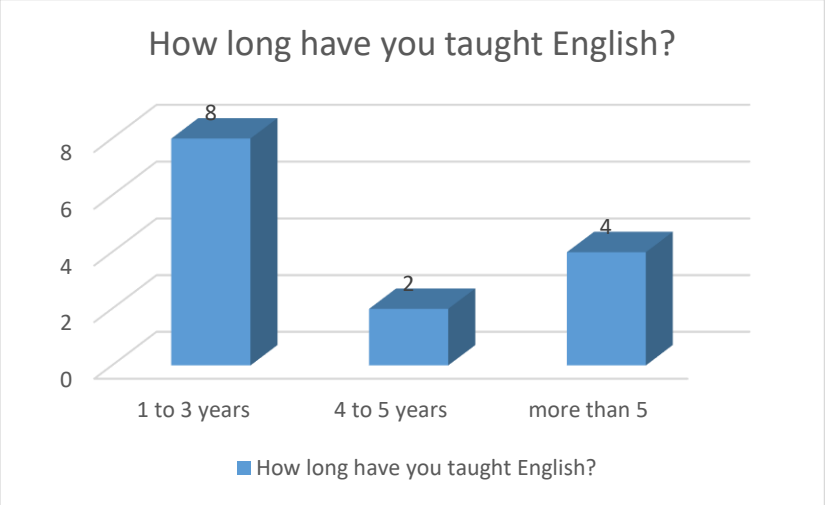
5.2. Participants' time of experience as English teachers.

This table shows teachers' responses to the question related to their years of experience in teaching English or/and Science.

Table 2. Participants' time of experience as English teachers.

	How long have you taught English?		
TOTAL	1 to 3	4 to 5	More than 5
14	8	2	4
100%	57%	14%	28%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 2. Years of experience as English teachers.

When analyzing the previous two tables, we can see that the majority of the participating teachers have achieved the university degree. Table No. 2 shows that 57 percent of the teachers surveyed have minimal experience in the field of education. However, teachers who work for **Panamá Bilingüe Program** are in constant preparation attending trainings.

5.3 Statistical Graphs and Analysis of Results

General results of the survey applied to the English/Science teachers at Centro Educativo Veracruz related to the use of the SIOP® model.

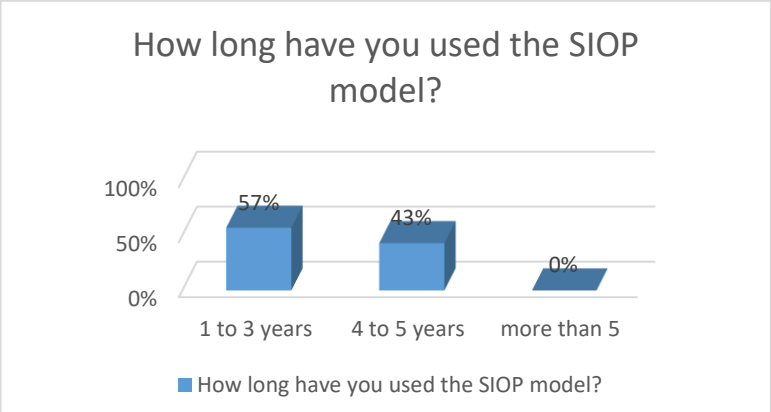
5.3.1. Experience using SIOP®.

Teachers were asked about their experience in using SIOP® model for planning their lessons.

Table 3. Experience using SIOP®.

How long have you used the SIOP model?	Total of participants	1 to 3 years	4 to 5 years	More than 5
	14	8	6	0
	100%	57%	42%	0%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 3. Teachers' experience in using SIOP.

In the survey applied to teachers at Centro Educativo Veracruz, they were asked how many years they have used the SIOP® model. Fourteen teachers surveyed, 57% have from one to three years using the SIOP® model, 14% have more than three years working with it and 28% of them have more than five years of experience working with the SIOP® model.

It is very important to notice that most of the respondents have minimal experience in the use of the SIOP® planning model. Since they mostly have one to three years of experience in teaching. However, the Ministry of Education calls each of them to receive training in this topic. For this reason, it is common in

conversations among teachers to hear about the terms Back to the Basics, which is the name given to these trainings or seminars. In schools, teachers support each other, which is a great advantage for new teachers.

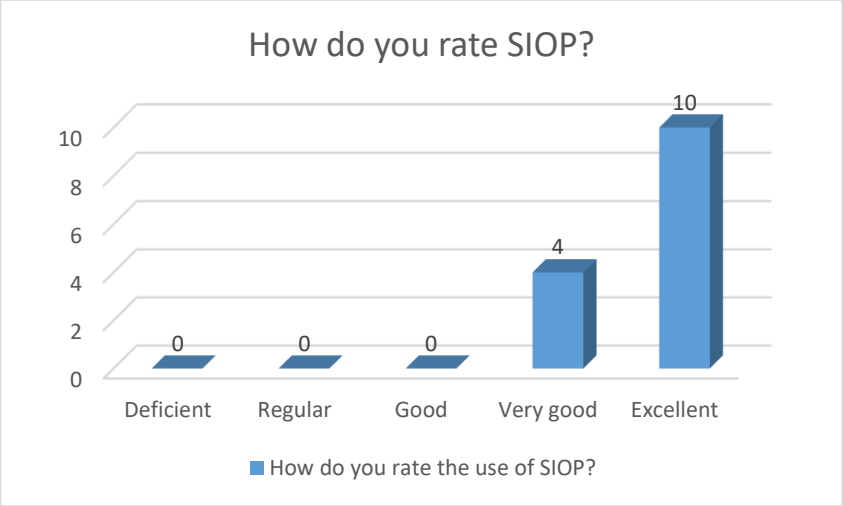
5.3.2. Rating the SIOP® model.

Teachers were asked what rating they give to SIOP® model and the result is presented in the following table and graph.

Table 4. Rating the SIOP® model.

		Opinion	Percentage
How do you rate the use of SIOP?	Deficient	0	0%
	Regular	0	0%
	Good	0	0%
	Very good	4	29%
	Excellent	10	71%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 4. Rating the SIOP model.

The results that this question provides demonstrate the acceptance of the model and its functionality. 71% of respondents rated it as excellent while 29% rated it as very good.

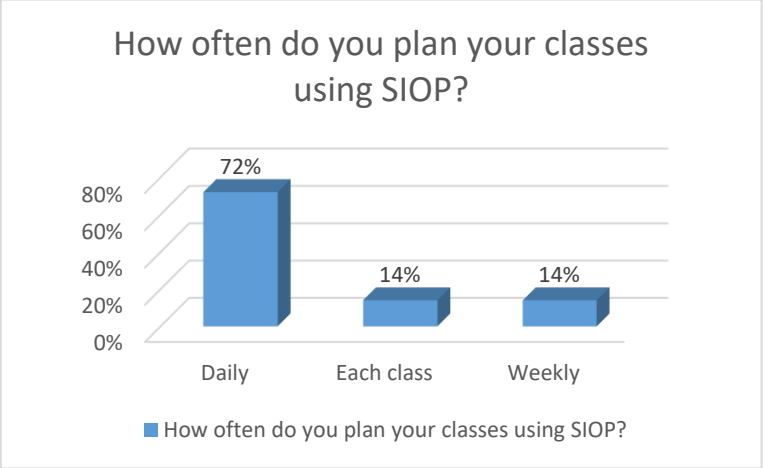
5.3.3. Frequency of use of the SIOP® model.

To better evaluate the model, it was necessary to ask the teachers the frequency of use of the SIOP® model. The following table shows their answers.

Table 5. Frequency of use of the SIOP® model.

		Opinion	Percentage
How often do you plan your classes using SIOP?	Daily	10	72%
	Each class	2	14%
	Weekly	2	14%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 5. Frequency of use of the SIOP model.

The previous graph leaves evidence that the SIOP® model is constantly used by teachers in Centro Educativo Veracruz. On a daily basis, 86% of the teachers surveyed use it and 14% of them said they prepare their planning each class. Our inquiring gives more information related to this question. Due to the fact that Science teachers teach only two periods weekly and at this school in block periods, so they prepare their classes weekly.

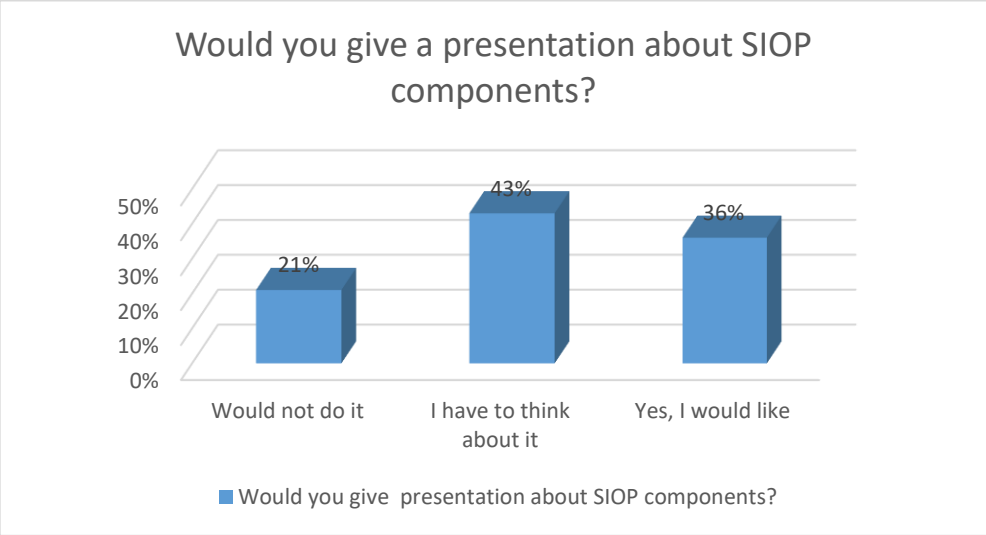
5.3.4. Would the participant give a Presentation about SIOP® components?

Result of the opinions of the teachers when asking them if they would make a presentation about the SIOP® model.

Table 6. Would the participant give a Presentation about SIOP® components?

		Opinion	Percentage
Would you give a presentation about SIOP components?	Would not do it	3	21%
	I have to think about it	6	43%
	Yes, I would like to do it	5	36%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 6. Presentation about SIOP components.

Opinions expressed by teachers suggest that the SIOP® model is understood almost in its entirety. 57% of teachers said they feel capable of making a presentation about the eight components of the SIOP® model and 43% of them show that they had to think about it before but did not refuse to make a presentation.

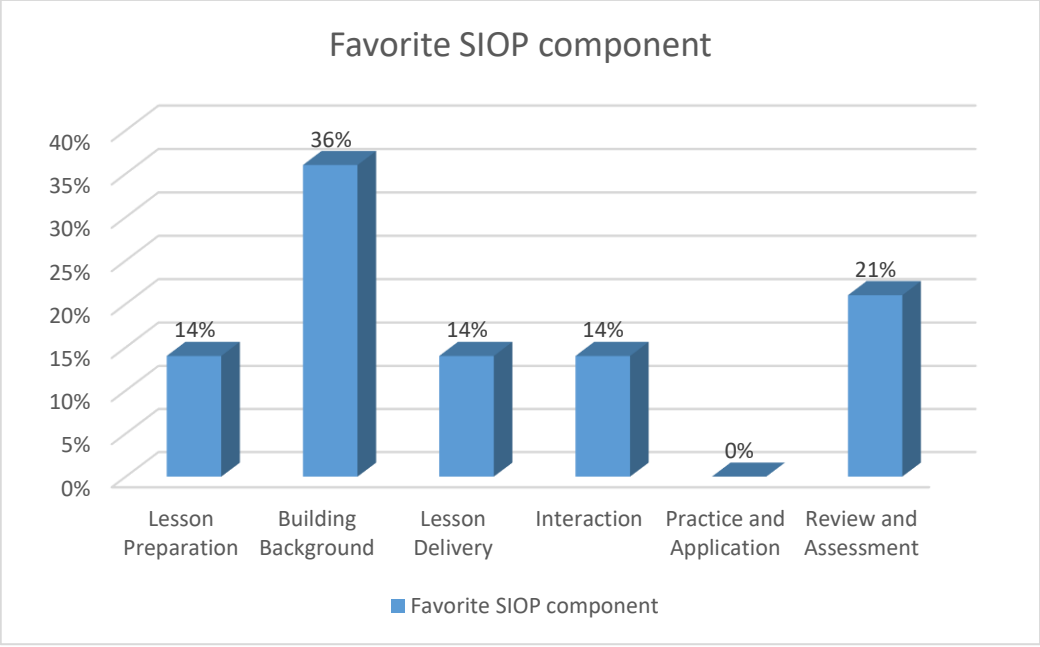
5.3.5 Teachers' favorite SIOP® component.

Result of the survey related to teachers' favorite SIOP® component. They were not allowed to choose more than one option to compare their opinions. Only six of the eight components were included. Strategies and Comprehensible Input were omitted this time. Let's see the results.

Table 7. Teachers' favorite SIOP® component.

		Opinion	Percentage
What is your favorite SIOP component?	Lesson Preparation	2	14%
	Building Background	5	36%
	Lesson Delivery	2	14%
	Interaction	2	14%
	Practice and Application	0	0%
	Review and Assessment	3	21%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 7. Teachers' favorite SIOP component.

English teachers at Centro Educativo Veracruz consider different components as the favorite of each of them. It can be seen that 36% of respondents consider Building Background their favorite SIOP® model component. As it could be seen before, Building Background is the second component of the SIOP® model. It consists in linking students' experiences and knowledge to the new one, emphasizing key vocabulary. This leads to the next question in the survey.

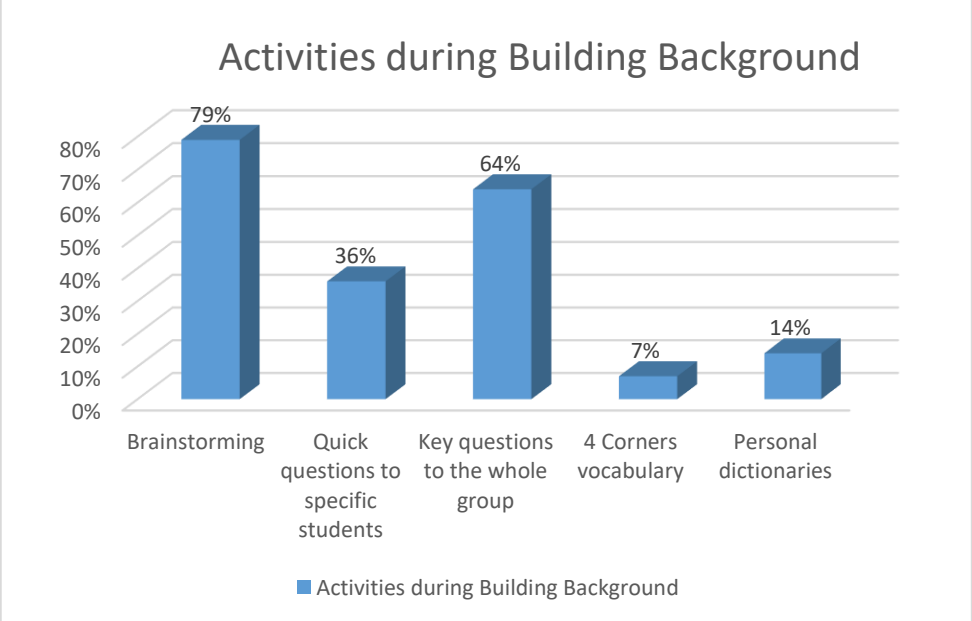
5.3.6. Activities students do during Building Background.

Result of the survey when asking the teachers the activities they do during Building Background. In this question, respondents were allowed to choose more than one option.

Table 8. Activities students do during Building Background.

		Opinion	Percentage
What activities do you do during Building Background?	Brainstorming	11	79%
	Quick questions to specific students	5	36%
	Key questions to the whole group	9	64%
	4 Corners vocabulary	1	7%
	Personal dictionaries	2	14%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 8. Activities students do during Building Background

This survey question allowed participants to choose more than one option from the ones presented. The result was very good since the brainstorm turned

out to be a favorite since it was selected by 79% of the respondents, followed by the key questions to the whole class with 64%.

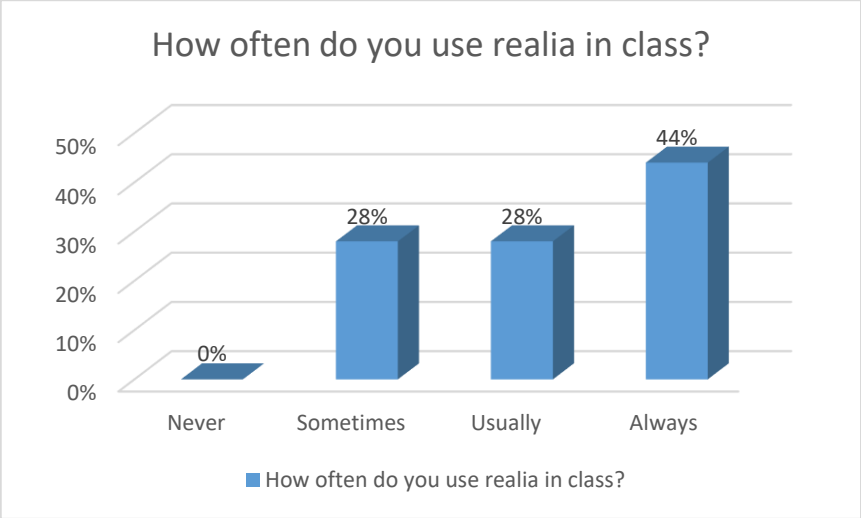
5.3.7. About the use of realia in class.

Result of the frequency of the use of real objects in classrooms.

Table 9. About the use of realia in class.

		Opinion	Percentage
How often do you use realia in class?	Never	0	0%
	Sometimes	4	28%
	Usually	4	28%
	Always	6	44%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 9. About the use of realia.

The graph that refers to table 9 shows that the teachers surveyed use real objects very frequently. Forty-four percent said they always use real objects in their classes. Which suggests that what the SIOP® model proposes with the use of real objects is effective for learning language.

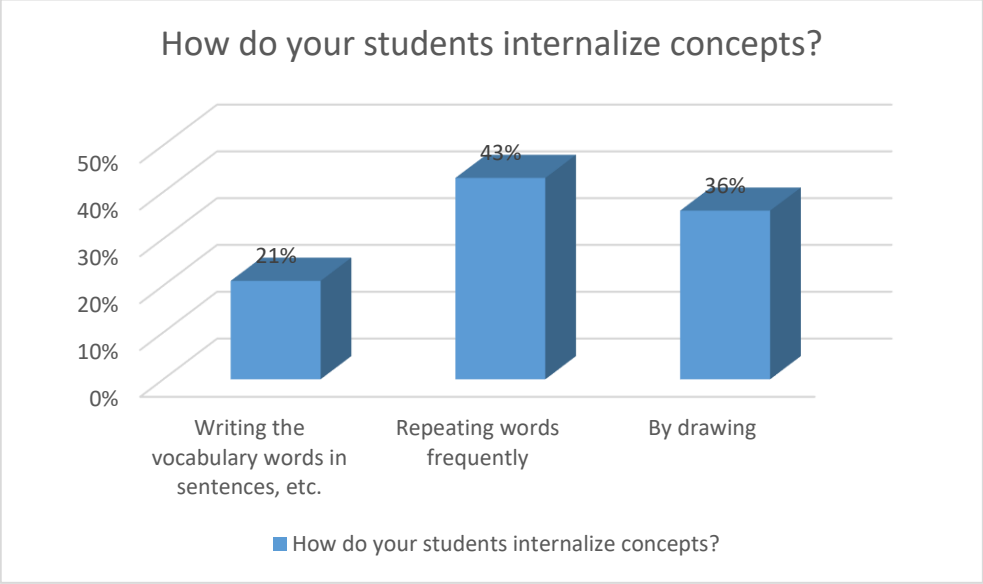
5.3.8. About how students internalize concepts.

Result of the survey by asking teachers how they think their students internalize the concepts better.

Table 10. About how students internalize concepts.

		Opinion	Percentage
In which of the following do you think your students internalize concepts?	Writing the vocabulary words in sentences, etc.	3	21%
	Repeating words frequently	6	43%
	By drawing	5	36%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 10. The way students internalize concepts.

Graph 10 shows the result of the question to the teachers about the way in which their students internalize the concepts better. The table shows that the technique of repetition is used more frequently than others by teachers at Centro Educativo Veracruz, but it also indicates that drawing and writing are used to help

students with the understanding of concepts. These three options are highly recommended by the SIOP® model.

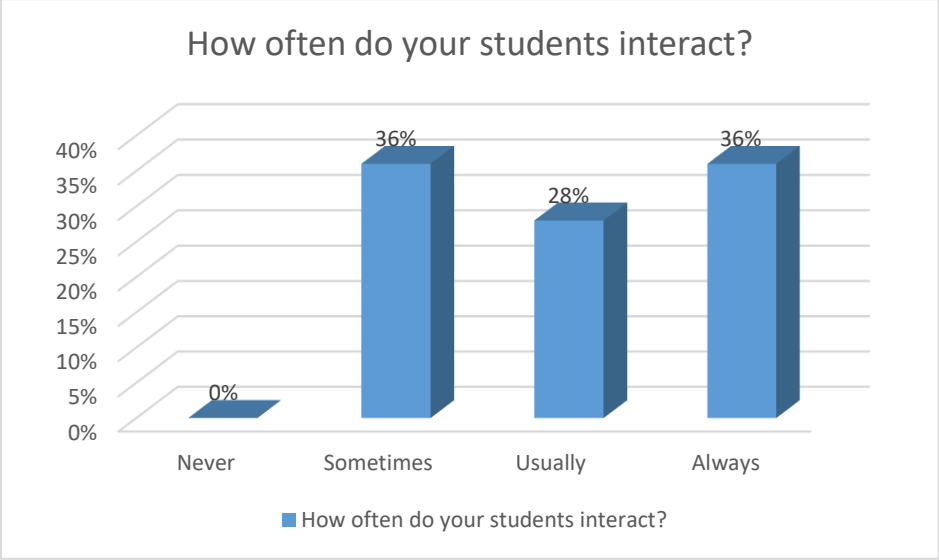
5.3.9. Students' interaction

How often do students interact during their class? Teachers said

Table 11. Students' interaction.

		Opinion	Percentage
How often do your students interact?	Never	0	0%
	Sometimes	5	36%
	Usually	4	28%
	Always	5	36%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 11. Students' Interaction

Graph 11 shows that 36 percent of the English teachers at Centro Educativo Veracruz only allow their students to interact sometimes. Although we have another 36 percent that always allows their students interact among them. While 28 percent expressed that their students regularly do some activities where they can share with their classmates.

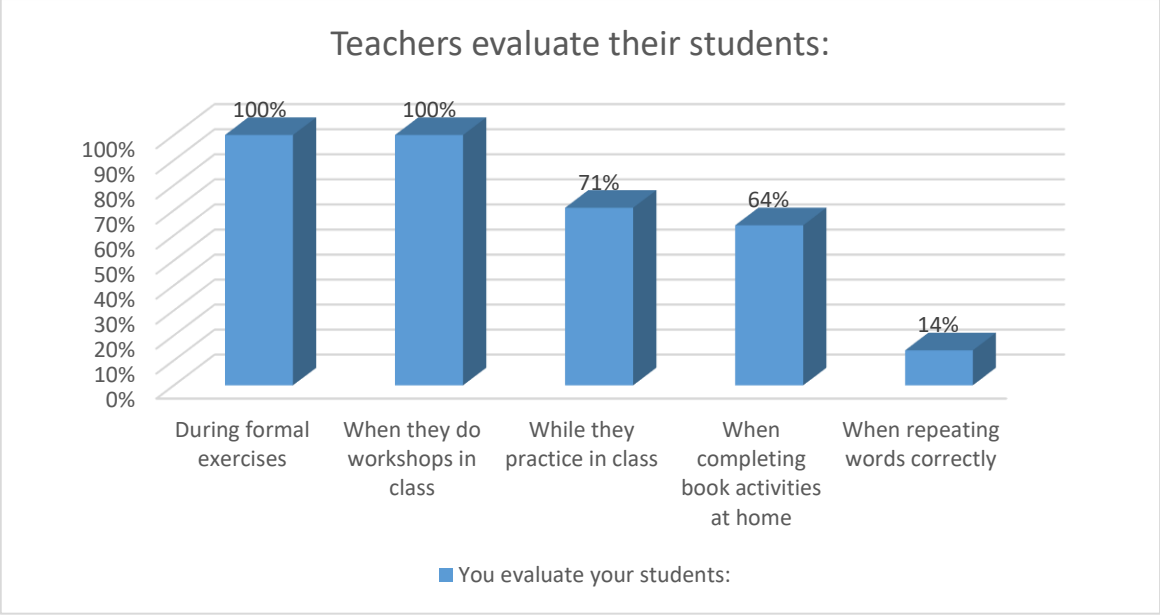
5.3.10. Assessing students.

In the survey, teachers answered about the evaluation of their students. In this question respondents were allowed to choose more than one option.

Table 12. Assessing students.

		Opinion	Percentage
You evaluate your students:	During formal exercises	14	100%
	When they do workshops in class	14	100%
	While they practice in class	10	71%
	When completing book activities at home	9	64%
	When repeating words correctly	2	14%

Source: Survey applied to teachers at Centro Educativo Veracruz, 2018.



Graph 12. Assessing students.

Our survey showed that students at Centro Educativo Veracruz are evaluated all the time. Graph 12 shows this. However, it is important to notice that although all teachers always evaluate their students, 100 percent when they

perform assigned exercises to solve in the classroom and workshops, they are also evaluated for their activities carried out at home.

Survey link: https://docs.google.com/forms/d/e/1FAIpQLScMdf-DRDQP7-HQ4dGtIqbtvXRN98faXRs3fj_o7ZXF1NgsZw/viewform?usp=sf_link

DISCUSSION

The SIOP® model is composed by eight components which are Preparation, Building Background, Comprehensible Input, Strategies, Interaction, Practice and Application, Lesson Delivery, and Review and Assessment. These components also contain thirty features that help teachers to reach effective instructions and techniques, also determine if they positively impact the students' achievement of English language and contents. The SIOP® components and its features (see Appendix) used as lesson planning guide, an observation (not evaluation) instrument, and as the focus of conferences and discussion is critical to the success of SIOP® implementation (Vogt & Echevarría, 2008).

It is highlighted that Preparation is the basic component for an effective lesson and students learning. Preparation is the step that properly guides the teachers during the whole lesson. Clear Content and Language objectives are meaningful in order to develop the rest of the components because it focusses teachers and students in the point of the topic.

In addition, the second component of the SIOP® model is also essential. Building Background helps teachers to link students' previous knowledge and experiences to new learning. But it is important that teachers not only activate students' prior knowledge but also build background for those who have these gaps in their understanding and background knowledge (Vogt & Echevarría, 2008). This requires teachers to make very explicit connections between what they have been taught in the past, which is the past learning, and he/she must include the explicit and purposeful development of vocabulary to foster comprehension. Once the students have connected their previous knowledge with the new lesson, we can say that we have aroused their interest in the subject, which indicates that the students are connected, involved in the class. At this time, you can reread the objectives and propose critical thinking. Without forgetting the use of an

appropriate language that students can understand the given instructions. Using comprehensible Input and strategies students will be more engaged and willing to actively participate during the class.

Although the observations were not very wide, it was possible easily identify in science classes the use of the SIOP® components. In teacher Ximena's class, it was frequently observed students working in groups. In Fidel's class, students orally answered several questions he asked about the previous class.

While talking with students from second grade, it was confirmed that they really enjoy and learn through the way teachers teach. They said: "*mi teacher de Science es mi favorita porque nos enseña a hacer cosas y nos deja dibujar y pintar. Me gustan sus canciones sobre los animales. Y para el English Week, tres compañeros y yo participamos con poemas y yo aún me lo sé. Escucha:*

Flowers, flowers everywhere,

In the garden, in my hair.

In the vase, at the store.

On the table, on the door.

What a lovely time of year,

Flowers blooming, bringing cheer".

The chance to share with several students of second grade was even. Most of them agreed on science being a great opportunity for them to learn and enjoy the classes. They feel comfortable during the class, they like the different activities teachers come to their classrooms and they also named some planets, and the parts of the plant.

In this research, very good results were obtained even though, most teachers at Centro Educativo Veracruz have three or less years of experience, they showed ample knowledge of the SIOP® components and its features. It is

showed in table 6 and graph 6 when they were asked if they would give a presentation about SIOP® components to new teachers. Thirty six percent of respondents said that they would like to do it, and forty three percent said they have to think about it, some of them say they can do it but they do not like to stand in front of an audience. Others say they clearly understand and manage the SIOP® lesson planning very well and they prefer working with partners and share ideas instead. It was expected no more than twenty percent would agree on giving a presentation.

Teachers not also know SIOP® components, they use them properly and it could be perceived while completing the survey. At the beginning, teachers were not willing to complete the survey, but then, they said that the survey was a moment to reflect and think about how well they manage the classroom, how well their classes go, what they need to improve, they also thought about evaluation. It was awesome to see that teachers feel comfortable when talking about SIOP® and they started asking questions and suggestions in order to improve and to get more ideas to develop and create classes and get meaningful results. Respondents talked about several activities to develop as a warm up, to build students' background, and practice.

A first grade Science teacher allowed us to publish a poster she made to teach the parts of the plant (see appendix 3). She describes the activity as a great opportunity to evaluate students' understanding. The poster has a plant and space to place the name of each part. Students are called to choose the name of a part of the plant (that are written one in different cards) the teacher said and placed it in the right position. During this single activity, the kid listens to the vocabulary, reads the word and shows knowledge of the meaning by placing the card in the correct place.

Our research indicates that teachers at Centro Educativo Veracruz show constant use of SIOP® to plan their lessons. They include realia, they allow students to interact and practice among them, they review objectives, it was also

clearly observed many of the components and subcomponents of SIOP® model. These details were seen while classrooms were visited looking for evidence to validate information teachers completed on our survey.

CONCLUSIONS

The use of the SIOP model in schools requires teachers to prepare themselves for their classes. Fortunately, The **Panamá Bilingüe Program** provides teachers with a lot of material for teachers to use in favor of offering an enjoyable class and offer students to have an unforgettable experience in each class.

Our research work has aroused the interest of teachers to be innovative in terms of the adjustments that the SIOP® model may need in Panama. The SIOP® model is flexible and can be adjusted to the Panamanian social context. It can also be adapted considering the needs of the groups and levels of English that students need.

The greatest achievement of this research work is that it gives an overview of the opportunities that teachers have to effectively apply the SIOP® model. Through the instruments used in this research, it was possible to corroborate that the SIOP® model is very helpful for educators. In addition, it shows that students feel interested in the new English and Science classes at this school.

The joy that students show when they receive their English teachers demonstrates that teachers are teaching well-structured classes and that it pleases students. It is important to bear in mind that routine is an important part in the development of children. When teachers go to the classroom with well-prepared lessons, the result is less-stressed teachers and dynamic classes with students' participation which becomes in an appropriate environment for learning. The SIOP® model is allowing students to acquire concepts and apply the skills required to learn a new language.

RECOMMENDATIONS

This research work leaves us with a series of information for us to analyze. This educational center has available digital material that teachers do not use because they do not have fixed tools in classrooms. Eventually, teachers can request a projector from the school's management to present the videos that each unit of the books suggests that students observe.

Although all books of all levels have pre-elaborated content and language objectives, some teachers are unaware of their existence. Because of this, they invest a lot of time in the preparation of their planning. It is suggested to share information among colleagues to facilitate the performance of time.

As in any profession, there are professionals with deficiencies and others with a lot of experience. Some teachers have been able to apply the knowledge acquired in the training offered. It costs a little to others. Aware of this need, we have provided some references about the SIOP® model so that whoever so wishes can be better oriented and has more resources and ideas to complete their classes by applying recommended activities for each of the components of the SIOP® model.

The teachers of this educational center may need a little effort to discover the importance of having new ideas, techniques and strategies to make their planning more innovative. We believe that our research work has promoted interest in renewing science classes at the school.

The SIOP® lesson planning is not recommended as a requirement for the teachers of the educational center. However, the coordinator eventually requests the planning books to make sure that it is being used. This situation shows us that there is still a lack of confidence on the part of the administrative system towards educators.

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APPENDIXES

Appendix 1. Interview Questions

1) What are the key factors when you plan your lesson? Which components or features of the SIOP Model do you already incorporate?

2) Building background is about providing the link between the past learning and new concepts. How do you activate students' prior knowledge and building background?

3) Do you think that it is important to use a variety of questioning strategies with English learners? Why?

4) What makes the activities the meaningful? How would they provide language practice?

5) Which techniques or strategies are helpful when students read, write, listen and speak about new information? Which specific activities do you use in your class?

6) What kinds of activities do you do for students to work together? How is the interaction part of the instruction?

7) How do you differentiate instruction to meet the needs of learners when they have difficulty?

8) What are some ways to provide constructive and specific academic feedback to students? How do you assess or monitor students' learning?

9) What are the common problems in your English classes? How do you solve them with using SIOP model?

10) What is your view on the effectiveness of SIOP in teaching language?

Taken from:

http://www.ejecs.org/index.php/JECS/article/view/13/pdf_3

Appendix 2. Survey

This survey is aimed at gathering information about the use of the SIOP Lesson Plan Framework and its benefits in the teaching process.

The following questions have been formulated for a research paper. The information collected on this survey is confidential and the identity of the submitters will remain anonymous.

How old are you?

20 – 25

25 – 30

30 – 40

More than 40

How long have you taught English?

1 - 3 years

4 - 5 years

more than 5 years

Education Level

Technician

Bachelor's degree

Master degree

Have you taught Science?

Yes____ No_____

Do you use the SIOP model for lesson planning?

Yes____ No_____

If you teach Science, how do you rate the use of SIOP for science classes?

1 is deficient and 5 is excellent _____

How often do you plan your classes using SIOP?

Daily____ Weekly____ Each class____

When do you do your SIOP planning?

_____

If you are asked to give a short presentation about the components of the SIOP model to new colleagues, you...

____Would not do it

____ Have to think about it

____ Yes, I would like to do it

What is your favorite component of the SIOP model?

_____

When choosing lesson objectives, you think about: (Mark all that apply)

____The smarter students

____ Students with special needs

____ Reachable objectives

____The lesson/topic you have to teach

____What you think students already know

____What you think students can understand

Name one activity you use to build students' background

_____

How often do you use realia in class?

1 is never and 5 is always _____

In which of the following do you think your students internalize concepts better?

___Writing the vocabulary words in sentences, paragraph, etc.

___ Repeating words frequently

___ Drawing

___ Other

How often do your students interact?

1 is never and 5 is always _____

You evaluate your students... (Mark all that Apply)

___When they complete formal exercises

___When they do workshops in class

___When they practice during activities in class

___When they complete book activities at home

___When they repeat the words correctly

Would you recommend the SIOP lesson planning?

Yes___ No____

Thanks for completing!

Appendix 3.

Resource for first grade students.

Appendix 4. Cronograma

UNIVERSIDAD ESPECIALIZADA DE LAS AMÉRICAS

College of Special Education and Pedagogy
School of Pedagogy

EVALUATION OF THE SIOP MODEL AND ITS BENEFITS IN TEACHING PROCESS OF THE SCIENCE SUBJECT IN STUDENTS OF SECOND GRADE OF CENTRO EDUCATIVO VERACRUZ.

Fecha de inicio: 03 de agosto de 2018
Fecha estimada de finalización: 20 de marzo de 2019

Activity	Semanas																														
	Agosto				Septiembre				Octubre				Noviembre				Diciembre				Enero				Febrero				Marzo		
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Revisión del título																															
Revisión bibliográfica																															
Revisión del marco teórico																															
Presentación del formato de inscripción																															
Aprobación y asignación de tutor																															
Organización y redacción de capítulos																															
Recomposición de la hipótesis y título																															
Recomposición de marco teórico																															
Preparación del cuetionario y encuesta																															
Entrevistas del cuestionario y encuesta																															
Tabulación de datos del cuestionario																															
(1) Borrador de avances al tutor																															
Correción del marco teórico																															
(2) Borrador de avances al tutor																															
Correción del marco teórico																															
(3) Borrador de avance al tutor																															
Aprobación por Director de tesis																															
Corrección definitiva																															
Presentación definitiva																															

Por: Abigail González

Appendix 5. **Presupuesto**

RUBROS	Cantidad	FUENTES	TOTAL
Personal	1	$ 120.00	$ 120.00
Asesoría	1	$ 125.00	$ 125.00
Equipos, software e internet	1	$ 155.00	$ 155.00
Bibliografía	1	$ 80.00	$ 80.00
Materiales e insumos	1	$ 142.00	$ 142.00
Servicios técnicos	1	$ 45.00	$ 45.00
Salidas al campo	1	$ 60.00	$ 60.00
Papelería	1	$ 28.00	$ 28.00
Impresiones	1	$ 56.00	$ 56.00
Otros (transporte, alimentación, etc.)	1	$ 75.00	$ 75.00
TOTAL		**$ 886.00**	**$ 886.00**

ANNEXES

Annex 1.

English Program - Planning Grid

<table>
<tr><td colspan="2">Teacher name and class: _____
Level: _____ Unit / Lesson Topic _____
Time Frame: _____ Date _____</td></tr>
<tr><td>Content Objectives: (What information/content will students learn by the end of the lesson?)</td><td>Language Objectives: (What language skills will students practice – include the four skill areas: R, W, L, S)</td></tr>
<tr><td>Key Vocabulary: (What words should students be introduced to during the lesson? What word should students master by the end of the lesson?)</td><td>Materials / Resources: (What materials and resources do you need to make available to help students reach the planned objectives?)</td></tr>
<tr><td colspan="2">Higher Order Thinking: (What will you do to help students use higher order thinking skills?)</td></tr>
<tr><td colspan="2">Warm Ups/Ice-Breakers (What songs, games, or activities, that are relevant to the unit, will warm-up the students for that day's activities? Can be a review activity from a prior day.)</td></tr>
<tr><td>Building Background:
• Links to experience:
• Links to learning:</td><td>Instructional Activities:
Check (✓) the activities on the list below that you will use in your lesson:</td></tr>
</table>

Lesson Delivery: *(main focus of the class)*
Presentation: *(include activities that help students reach language and content objectives, provide comprehensible input, practice good language learning strategies, and allow for student interaction and feedback)*

Differentiation Strategies
___ Tiered assignments
___ Flexible grouping
___ Learning centers
___ Curriculum compacting
___ Varying questions
___ Independent Projects
___ Brain Compatible Instruction
___ Learning Styles
___ Cultural Contexts

Teaching Strategies
___ Scaffolded Questioning
___ Independent reading/
___ Reading in groups or pairs
___ Interpretation of Graphics (maps, graphs, cartoons, tables…)
___ Cooperative Learning
___ Think-Pair-Shares

___ Gallery Walk
___ Turn-N-Talks
___ Roundtable
___ Jigsaw
___ Pairs Check/Review
___ Independent/Group Project
___ Integration of Technology
___ Print alternatives, i.e., E-text
___ Use of Audio Clip/Music
___ Interactive Student Notebook®
___ Formal Writing
___ Informal Writing
___ Graphic/Visual Organizers
___ Modeling/Demonstration
___ Think Aloud
___ Reciprocal Teaching
___ Group Activities
___ Simulation
___ Wait time
___ Different purposes for viewing/reading
___ Cross-Curricular Connections

Lesson Delivery (continued)

Assessment:
Formative Assessment(s): *(Can I move on? Who needs remediation? Grouping strategies/who can work together to support learning?)*

Summative Assessment(s): *(Final test, grade, decision **based on multiple assessments**)*

Suggested Assessments:
___ Collect and Grade
___ In-Class Check
___ Checklist
___ Journal/Learning Log
___ Constructed Response
___ Test
___ Performance Assessment
___ Check for Completion
___ Rubric
___ Peer/Self-Assessment
___ Portfolio
___ Quiz
___ Presentation
___ Informal Assessments
___ Ticket Out (after review of the objectives, end of day)
___ Teacher mental/physical checklist during group activities (teacher's observation while students are working)

Out of Class Assignment (homework)**:**

Teacher Reflection: *(After class, reflect about lesson presented. What could be improved for next time?)*

Instructional Expectations Checklist:

- ❑ Target language is used by instructor
- ❑ Students' background knowledge is activated
- ❑ Learning is framed
- ❑ Students demonstrate understanding of tasks/language
- ❑ Manipulatives/ learning styles are considered
- ❑ Formative assessments/ immediate feedback are used
- ❑ *Productive* use of target language by students (speaking, writing, group activities)
- ❑ Demonstration of *receptive* skills in target language by students (listening/reading)
- ❑ Use of differentiated strategies
- ❑ Wrap up objectives of class

Annex 2. SIOP Planning Example

Teacher name and class: A. González / Elementary class
Level: 2nd **Unit / Lesson Topic** Life Cycles
Time Frame: 40 minutes **Date** March 13, 2019

Content Objectives: *(What information/content will students learn by the end of the lesson?)*
SWBAT demonstrate knowledge of the life cycle of an amphibian (frog) by illustrating and labeling the stages.

Language Objectives: *(What language skills will students practice – include the four skill areas: R, W, L, S)*
SWBAT demonstrate analysis of the life cycle of an amphibian (frog) by writing a summary explaining the cycle using cloze sentences.

Key Vocabulary: *(What words should students be introduced to during the lesson? What word should students master by the end of the lesson?)*

Similar, different, metamorphosis, embryo, tadpole, and cells.

Materials / Resources: *(What materials and resources do you need to make available to help students reach the planned objectives?)*
Overhead of butterfly cycle, overhead of frog life cycle students journals, Text: "the metamorphosis: from tadpole to frog"

Higher Order Thinking: *(What will you do to help students use higher order thinking skills?)*
Why is it important to know about plant and animals cycles?

Warm Ups/Ice-Breakers *(What songs, games, or activities, that are relevant to the unit, will warm-up the students for that day's activities? Can be a review activity from a prior day.)*

Building Background:
- Links to experience:
- SW review in their science journals previous notes and quick-writes on the butterfly cycle.
- Links to learning:
- SW do a quick-write answering the following questions:
  1- What does metamorphosis mean?
  2- Where have you seen butterflies outside of the school?
  3- Draw and label the stages of the life cycle of a butterfly.

Lesson Delivery: *(main focus of the class)*
Presentation: *(include activities that help students reach language and content objectives, provide comprehensible input, practice good language learning strategies, and allow for student interaction and feedback)*

Instructional Activities:
Check (✓) the activities on the list below that you will use in your lesson:

Differentiation Strategies
___ Tiered assignments
___ Flexible grouping
___ Learning centers
___ Curriculum compacting
___ Varying questions
___ Independent Projects
___ Brain Compatible Instruction
___ Learning Styles
___ Cultural Contexts

Teaching Strategies
___ Scaffolded Questioning
___ Independent reading/
___ Reading in groups or pairs
___ Interpretation of Graphics (maps, graphs, cartoons, tables…)
___ Cooperative Learning
___ Think-Pair-Shares

___ Gallery Walk
___ Turn-N-Talks
___ Roundtable
___ Jigsaw
___ Pairs Check/Review
___ Independent/Group Project
___ Integration of Technology
___ Print alternatives, i.e., E-text
___ Use of Audio Clip/Music
___ Interactive Student Notebook®
___ Formal Writing
___ Informal Writing
___ Graphic/Visual Organizers
___ Modeling/Demonstration
___ Think Aloud
___ Reciprocal Teaching
___ Group Activities
___ Simulation
___ Wait time
___ Different purposes for viewing/reading

- TW review on the overhead the stages of the life cycle of the butterfly emphasizing the term *Metamorphosis.*

Lesson Delivery (continued)

- SW read "The Metamorphosis: From Tadpole to Frog".
- SW, in a group, illustrate and label each stage of the life cycle of a frog using a piece of chart paper including key vocabulary.

___ Cross-Curricular Connections

Assessment:

Formative Assessment(s): *(Can I move on? Who needs remediation? Grouping strategies/who can work together to support learning?)*

- Students' posters including the word metamorphosis, embryo, tadpole, and cells.
- SW share their writing with a partner and with the teacher.
- TW make a statement; if it is true, students stand; if false they stay seated.

Examples:
The life cycle of a frog and the life cycle of the butterfly both have four stages.
Both frogs and butterflies go through metamorphosis.
Both frogs and butterflies begin as a single egg.
SW complete the following sentence.
The life cycle begins with an egg which forms into an _____. After 21 days the _____ then becomes a _____ which has a long tail and lives in the water. Finally, as the tail becomes smaller and the legs get longer you have _____.

Summative Assessment(s): *(Final test, grade, decision **based on multiple assessments**)*

Suggested Assessments:

___ Collect and Grade
___ In-Class Check
___ Checklist
___ Journal/Learning Log
___ Constructed Response
___ Test
___ Performance Assessment
___ Check for Completion
___ Rubric
___ Peer/Self-Assessment
___ Portfolio
___ Quiz
___ Presentation
___ Informal Assessments
___ Ticket Out (after review of the objectives, end of day)
___ Teacher mental/physical checklist during group activities (teacher's observation while students are working)

Out of Class Assignment (homework)**:**

Teacher Reflection: *(After class, reflect about lesson presented. What could be improved for next time?)*

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- ❑ Manipulatives/ learning styles are considered
- ❑ Formative assessments/ immediate feedback are used
- ❑ *Productive* use of target language by students (speaking, writing, group activities)
- ❑ Demonstration of *receptive* skills in target language by students (listening/reading)

- ❑ Use of differentiated strategies
- ❑ Wrap up objectives of class

Source: 99 Ideas and Activities for Teaching English Learners with The SIOP Model, pp 45-46.

Annex 3. The Sheltered Instruction Observation Protocol

Observer: _____ Teacher: _____
Date: _____ School: _____
Grade: _____ ESL level: _____
Class: _____ Lesson: Multi-day Single-day (circle one)

Directions:
Circle the number that best reflects what you observe in a sheltered lesson. You may give a score from 0–4.
Cite under "Comments" specific examples of the behaviors observed.

Total Score: ❑ %Score ❑ Tape #:_____

	Highly Evident 4	3	Somewhat Evident 2	1	Not Evident 0	NA
Preparation						
1. Clearly defined content objectives for students	☐	☐	☐	☐	☐	
2. Clearly defined language objectives for students	☐	☐	☐	☐	☐	
3. Content concepts appropriate for age and educational background level of students	☐	☐	☐	☐	☐	
4. Supplementary materials used to a high degree, making the lesson clear and meaningful (graphs, models, visuals)	☐	☐	☐	☐	☐	
5. Adaptation of content (e.g., text, assignment) to all levels of student proficiency	☐	☐	☐	☐	☐	☐
6. Meaningful activities that integrate lesson concepts (e.g., surveys, letter writing, simulations, constructing models) with language practice opportunities for reading, writing, listening, and/or speaking	☐	☐	☐	☐	☐	
Comments:						
Instruction						
Building Background	4	3	2	1	0	NA
7. Concepts explicitly linked to students' background experiences	☐	☐	☐	☐	☐	☐
8. Links explicitly made between past learning and new concepts	☐	☐	☐	☐	☐	
9. Key vocabulary emphasized (e.g., introduced, written, repeated and highlighted for students to see)	☐	☐	☐	☐	☐	
Comments:						
Comprehensible Input	4	3	2	1	0	
10. Speech appropriate for students' proficiency level (e.g., slower rate, enunciation and simple sentence structure for beginners)	☐	☐	☐	☐	☐	
11. Explanation of academic tasks clear	☐	☐	☐	☐	☐	
12. Uses a variety of techniques to make content concepts clear (e.g., modeling, visuals, hands-on activities, demonstrations, gestures, body language)	☐	☐	☐	☐	☐	☐
Comments:						
Strategies	4	3	2	1	0	
13. Provides ample opportunities for student to use strategies	☐	☐	☐	☐	☐	
14. Consistent use of scaffolding techniques throughout lesson, assisting and supporting student understanding such as think-alouds (see Glossary)	☐	☐	☐	☐	☐	
15. Teacher uses a variety of question types throughout the lesson including those that promote higher-order thinking skills (e.g., literal, analytical, and interpretive questions)	☐	☐	☐	☐	☐	
Comments:						

	Highly Evident 4	3	Somewhat Evident 2	1	Not Evident 0	NA
Interaction						
16. Frequent opportunities for interactions and discussion between teacher/student and among students, which encourage elaborated responses about lesson concepts	☐	☐	☐	☐	☐	
17. Grouping configurations support language and content objectives of the lesson (see Glossary)	☐	☐	☐	☐	☐	
18. Consistently provides sufficient wait time for student response	☐	☐	☐	☐	☐	
19. Ample opportunities for students to clarify key concepts in L1 (see Glossary)	☐	☐	☐	☐	☐	☐
Comments:						
Practice/Application	4	3	2	1	0	NA
20. Provides hands-on materials and/or manipulatives for students to practice using new content knowledge	☐	☐	☐	☐	☐	
21. Provides activities for students to apply content and language knowledge in the classroom	☐	☐	☐	☐	☐	☐
22. Uses activities that integrate all language skills (i.e., reading, writing, listening, and speaking)	☐	☐	☐	☐	☐	
Comments:						
Lesson Delivery	4	3	2	1	0	
23. Content objectives clearly supported by lesson delivery	☐	☐	☐	☐	☐	
24. Language objectives clearly supported by lesson delivery	☐	☐	☐	☐	☐	
25. Students engaged approximately 90–100% of the period (see Glossary)	☐	☐	☐	☐	☐	
26. Pacing of the lesson appropriate to the students' ability level	☐	☐	☐	☐	☐	
Comments:						
Review/Assessment	4	3	2	1	0	
27. Comprehensive review of key vocabulary	☐	☐	☐	☐	☐	
28. Comprehensive review of key content concepts	☐	☐	☐	☐	☐	
29. Regularly provides feedback to students on their output (e.g., language, content, work)	☐	☐	☐	☐	☐	
30. Conducts assessment of student comprehension and learning of all lesson objectives (e.g., spot checking, group response) throughout the lesson (see Glossary)	☐	☐	☐	☐	☐	
Comments:						

Echevarria, J., Vogt, M. E., & Short, D. J. (2000). *Making content comprehensible for English language learners: The SIOP model*. Newton, MA: Allyn & Bacon.

Source: School Reform and Standards-Based Education: A Model for English Language Learners. Jana Echevarria, Deborah Short, and Kristin Powers(2006). http://edfs200ell.pbworks.com/w/file/fetch/54561001/EchevarriaShort-SchRefSBEELLs.pdf

Annex 4. The SIOP® Model Self-Assessment

Using the features below, mark the box that most closely represents your current teaching practices:

D=Daily, O=Often/Occasionally, N=Never

PREPARATION	**D**	**O**	**N**
1. I define, display, and review my *content objectives* with students each day.			
2. I define, display, and review my *language objectives* with students each day.			
3. My *content concepts* are appropriate for the age and educational background of my students.			
4. I use *supplementary materials* (graphs, models, visuals) to make the lesson clear and meaningful.			
5. I *adapt my content* (text, assignment) to all levels of student proficiency.			
6. I plan m*eaningful activities* that integrate lesson concepts (surveys, letter writing simulations, and constructing models) with language practice opportunities for *reading, writing, listening, and speaking.*			
BUILDING BACKGROUND			
7. I *link the concepts* l teach to students' background experiences.			
8. I *link new concepts* to past learning.			
9. *Key vocabulary is emphasized in my classroom* (introduced, written, repeated, and highlighted for students to see).			
COMPREHENSIBLE INPUT			
10. When needed, I use slower rate of *speech*, clear pronunciation, simple sentence structure so that my students can understand me.			
11. I provide *clear explanations of* academic tasks (in English)			
12. I use a variety of *techniques* to make content concepts clear (modeling, visuals, hands-on activities, demonstrations, gestures, body language).			
STRATEGIES			
13. I provide ample opportunities for students to use *learning strategies.*			
14. *Scaffolding techniques* are used throughout my lessons to assist and support student understanding.			
15. I use a variety of *questions and tasks throughout my lessons that promote higher-order thinking skills*.			

D=Daily, O=Often/Occasionally, N=Never

INTERACTION	**D**	**O**	**N**
16. I plan frequent opportunities for *interaction and discussion* among students and between teacher and students.			
17. My *grouping configurations* support language and content objectives of my lesson.			
18. I consistently provide sufficient *wait time for student responses.*			
19. I provide ample opportunities for students to *clarify key concepts in their first language (L1)* as needed.			
PRACTICE AND APPLICATION			
20. I provide *hands-on* materials and/or manipulatives for students to practice using new knowledge.			
21. I provide activities for students to *apply content and language knowledge.*			
22. I plan activities that integrate all *language skills*: *reading, writing, listening, and speaking.*			
LESSON DELIVERY			
23. My *content objectives* are clearly supported by lesson delivery.			
24. My *language objectives* are clearly supported by lesson delivery			
25. My *students are engaged* approximately 90-100% of the period.			
26. The *pacing* of my lessons is appropriate to students' ability levels.			
REVIEW AND ASSESSMENT			
27. I *clearly review key vocabulary.*			
28. I *clearly review key content concepts.*			
29. I provide frequent *feedback* to students on their output.			
30. I *assess* student comprehension and learning throughout the lesson.			