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Chemistry Spanish Supplemental Resources for English Language Learners in a 9th Grade Bilingual Physical Science Class

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CHEMISTRY SPANISH SUPPLEMENTAL RESOURCES FOR ENGLISH
LANGUAGE LEARNERS IN A 9TH GRADE BILINGUAL PHYSICAL SCIENCE
CLASS

A Project Report

Presented to

The Graduate Faculty

Central Washington University

For the Degree of
Master of Education
Master Teacher

by

Rebecca Minerva Guerrero

June 2010

CENTRAL WASHINGTON UNIVERSITY

Graduate Studies

Final Examination of

Rebecca Minerva Guerrero

B.A., Central Washington University, 2001

For the Degree of

Master of Education

Master Teacher

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1:00 p.m.

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Courses presented for the Master's degree

Course No.	Course Title	Number of Credits	Instructor	Quarter Completed
ECTL 601	Pro Cert Pre-Assessment	4	J.Charbonneau	Fall, 2007
EDCS 516	Media Ut: Advanced Theory	3	G. Alldredge	Fall 2007
EDF 567	Educational Change	3	S. Locke	Fall 2007
EDCS 565	Program of Curriculum Dev.	3	S. Schmitz	Winter 2008
EDF 508	Comparative Education	3	S. Schmitz	Winter 2008
ECTL 609	Pro Cert Culmination Sem.	2	J. Charbonneau	Spring 2008
EDF 503	Philosophy of Education	3	R. Bowers	Spring 2008
EDCS 513	Creative Teaching	3	L. Sevigny	Fall 2008
EDF 501	Education Foundation	3	D. Haskell	Fall 2008
EDF 507	St/Pr Intercultural Studies	3	D. Woodcock	Fall 2008
EDAD 580	Educational Administration	5	H. Williams	Winter 2009
EDF 505	Ed. Measure for Teachers	3	S. Schmitz	Winter 2009
EDF 510	Ed. Research and Dev.	4	S. Stein	Spring 2009
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CENTRAL WASHINGTON UNIVERSITY

Graduate Studies

We hereby approve the project report of Rebecca Minerva Guerrero

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ABSTRACT

CHEMISTRY SPANISH SUPPLEMENTAL RESOURCES FOR ENGLISH LANGUAGE LEARNERS IN A 9TH GRADE BILINGUAL PHYSICAL SCIENCE CLASS

by

Rebecca M. Guerrero

June 2010

Minority high school students in the state of Washington find themselves under a variety of intense pressures: the pressure to learn English quickly, the pressure to pass the High School Proficiency Exam (HSPE) in order to graduate, and lastly the pressure to be an academic leader for that minority.

In 2013, the state will add the science portion to the HSPE. The challenges that teachers face when working with English language learners (ELL) is having the adequate training, necessary tools, and resources needed to increase student achievement. This project is designed to provide Spanish supplemental resources for ELL students in a 9th grade bilingual physical science class, specifically in the Yakima School District. The project provides teachers with laboratory experiments, lecture notes, practice worksheets, and activities that clearly state the learner objectives that comply with the Washington State Learning Standards.

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CHAPTER I

Overview

Students in Washington State are required by the No Child Left Behind Act (NCLB) of 2001 to take the High School Proficiency Exam (HSPE), formally known as the Washington Assessment of Student Learning (WASL), in the 10th grade. Students are tested in reading, writing, math, and science. Beginning in 2013, all 10th grade students must pass all four sections of the HSPE in order to graduate.

The problem is that students in Washington are failing science. According to the Office of the Superintendent of Public Instruction (2009), 61.2% of 10th grade students did not meet the science standards in 2008-2009. In 2007-2008, 60% did not meet the standards (Office of the Superintendent of Public Instruction, 2008). This is devastating data and clearly a message that students are lacking the skills in science. If they cannot pass the test, how will they graduate? According to the United States Department of Labor, it is projected that nearly six million jobs requiring math and science skills will go unfilled because there won't be enough qualified Americans to hold them.

The school where I teach is located in Yakima, Washington. The Yakima School District is located in a rural community in eastern Washington. It is a school district that serves over 14,000 students that come from many ethnic backgrounds. It is the largest Latino-majority district in the state serving approximately 64% Hispanics. Many are first generation immigrants who enter schools with limited English skills. Twenty-six percent are considered transitional bilingual and 22.7% qualify as migrant. The district also serves 77.6% of students who qualify for free or reduced-price meals.

According to OSPI (2009), an astounding 78.5% of 10th grade students in the Yakima School District did not meet the science standard. In 2008, 77% of students did not meet the standard. Many factors can contribute to why students are not passing the test, but it is clearly evident that the school district must focus their attention on Hispanic students and the resources needed to increase student achievement.

So what is being done? In 1979, legislatures created the State Transitional Bilingual Instructional Program (STBIP) to “insure equal educational opportunities” for English language learners in K-12 public schools (Washington State Institute for Public Policy, 2005). Both state and federal law require that public schools provide specialized instruction to English language learners (ELL). In Washington State, school districts must implement bilingual programs that use both English and the students’ native language in instruction. English as a Second Language (ESL) programs are authorized only when the native language instruction is not feasible and therefore, instruction is in English and students receive help based on their English proficiency levels.

Students who qualify for ELL services are placed in bilingual classes and have three years to transition into mainstream classes. If students enter the school system in their high school years, they have one year to transition into mainstream classes and are required to take the HSPE after six months in the United States.

The body of research indicates that there needs to be a focus on bilingual education with an emphasis on training teachers on how to work with ELL students and supporting the students’ language and culture. Freeman and Crawford (2008) support the use of Spanish resources for ELL students to increase student achievement. Their

research emphasizes and supports the use of the students' native language to fully understand scientific terminology before they can translate it into another language. They also stress that Spanish resources must not replace the current curriculum, and that it should only be used as a supplement.

Carrier (2005) also supports the use of Spanish resources and introduces the concept of clearly defining learner objectives. The objectives must be used for each lesson so that students understand what they are expected to learn. Teachers also need the appropriate professional development training to work with ELL students.

Purpose of the Project

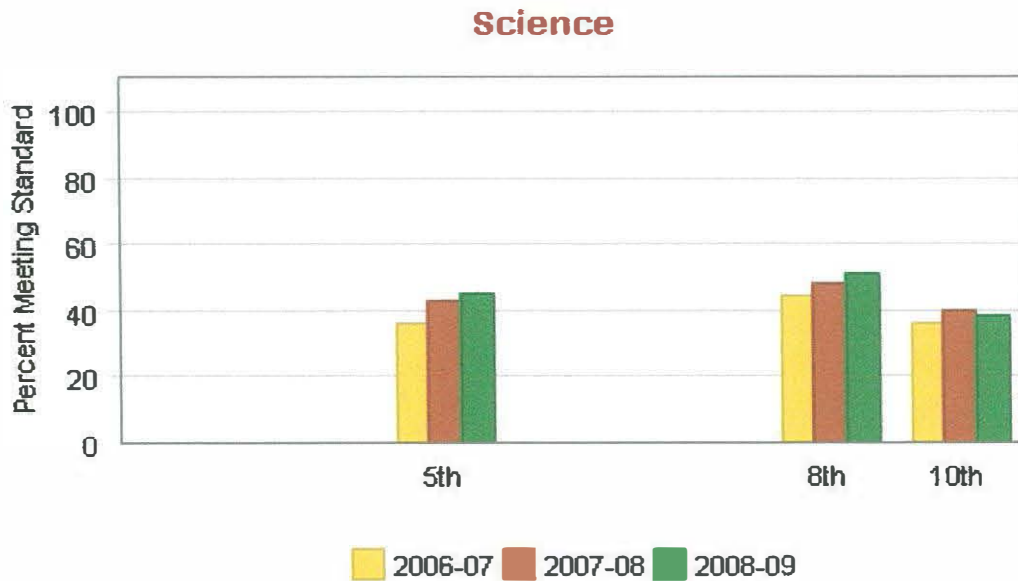
The purpose of this project was to create chemistry supplemental resources in Spanish for a 9th grade bilingual physical science class. The model will provide Spanish resources for ELL students that are aligned with the Washington state learning standards in science. Each resource will contain clear learner objectives for the students to understand what they are expected to learn. The body of research available indicates that it is imperative that ELL students get the appropriate instruction and tools in order to increase their skills in science. Providing support with Spanish materials will help bridge the gap of failing ELL students in science. The criteria of this project are to increase student achievement on performance based assessments where science is required. Improving student's abilities in science can lead to many learning opportunities such as higher education, careers in medicine, and an increase of the Hispanic population in the scientific field.

Significance of the Project

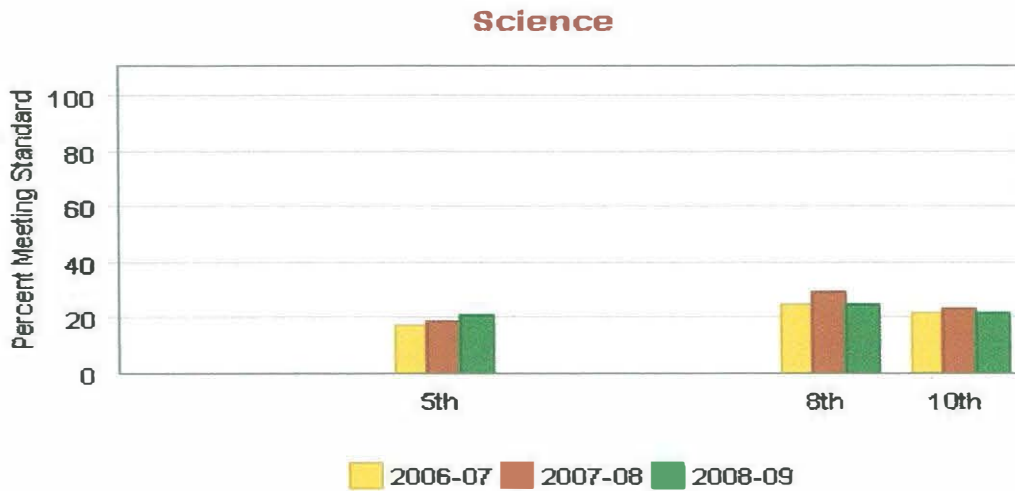
In a time where the United States is struggling in an economic depression and jobs that require strong math and science skills are left unfilled, it is necessary to hold students, teachers, parents, and school districts accountable for student learning.

The U.S. is failing in science. According to the Nations Report, only 18% of 12th graders performed either at or above Proficient or Basic for the science achievement level. The tables below show the percentage of 10th grade students in Washington State who have met the science standard.

WASL results for Washington State (OSPI, 2009)



WASL results for Yakima School District (OSPI, 2009)



Teachers need to understand that the learning challenges of ELL students differ from native English speakers in the science classroom (Carrier, 2005). According to Roseberry-McKibbin, Brice, & O’Hanlon (2005), there is a lack of ELL trained teachers because university textbooks do not prepare teachers on service delivery to ELL’s.

In 2005, the WEA State TBIP stated that there has been a challenge for school districts to recruit qualified bilingual teachers. Because there is a shortage of qualified teachers, school districts must hire paraprofessionals to provide instructional assistance such as tutoring to ELL’s.

Research shows that students in a bilingual class must feel value in their culture, language, and they should be given the opportunity to first develop their science skills in Spanish and then English (Michael, Andrade & Bartlett (2007).

Definition of Terms

CONEVYT (Consejo Nacional de Educación Para la Vida Y El Trabajo): translated as national council for life and work.

Bilingual Education: the practice of teaching non-English speaking students core subjects in their native language as they learn English.

English as a second language (ESL): the use or study of English by speakers with a different native language.

English language learners (ELL): a student who speaks one or more languages other than English and is developing proficiency in English.

English proficiency level: To be proficient in a second language means to effectively communicate or understand thoughts or ideas through the language's grammatical system and its vocabulary, using its sounds or written symbols. Language proficiency is composed of oral (listening and speaking) and written (reading and writing) components as well as academic and non-academic language (Hargett, 1998).

High School Proficiency Exam- 10th grade exam administered to the students in Washington. Students are assessed on reading, writing, math, and science.

Learner objectives: goals or outcomes of what the learner is required to know.

No Child left behind Act of 2001 (NCLB): defined by each state under section 1111(b) (2) of the *No Child Left Behind* Act, “adequate yearly progress” is the measure of yearly progress of the state and of all public schools and school districts in the state toward

enabling all public school students to meet the state's academic content and achievement standards.

Physical science: the study of non-living things.

Washington State Science Learning Standards: describes what students should know and be able to do at each grade expectation.

State Transitional Bilingual Instruction Program (STBIP): The STBIP addresses the needs of students from linguistically and culturally diverse backgrounds and to help them achieve high performance standards in Washington State.

Washington Assessment of Student Learning (WASL): the standardized test that is proctored for all 4th, 7th, and 10th graders in Washington state. It is designed to measure student academic achievement.

The Washington Language Proficiency Test II (WLPT-II): annually assesses the growth of the state's English language learners in reading, writing, listening and speaking.

Organization of the Project

The project is organized into five chapters. The first chapter contains an introduction, purpose of the project, significance of the problem, definition of terms, and organization of the project. A review of the literature is contained in chapter two. The procedures that were used in the project are described in chapter three. Chapter four contains the model of the supplemental Spanish resources. And lastly, chapter five contains the summary, conclusion, and recommendations, of the project.

CHAPTER II

The Problem

Most everyone can agree that schools are an important factor in the success of the country. If schools do not provide the appropriate education to compete with other countries, it is not just the students that suffer, it is the whole world. Greek philosopher Aristotle argued that education is the primary focus and business of the state. Every child must receive a good education, be trained in one specific trade, and be a productive citizen by exercising their right to vote.

In 1977, Washington State implemented the Basic Educational Act in which legislatures defined the school districts role of providing a “basic” education for all students. What exactly does “basic education” mean? Children today are attending schools that are over 50 years old! These buildings have old boiler systems, no air conditioning, pieces of tile are missing, the plumbing is broken, and the electrical systems need to be updated. Not only are school structures falling apart, but many also lack the necessary educational tools such as highly qualified teachers, technology, and books.

Many school districts around the state are scrambling to keep up with the No Child Left Behind Act of 2001, which states that schools must create a test based on academic achievement and must meet annual yearly progress. Since this act has taken place, school districts are being held accountable for student progress. If there is regression in yearly progress, schools districts risk a loss in funding. This in turn creates cuts in programs and teacher jobs. It does not make sense to take monies away that fund

necessary programs such as intervention and bilingual programs. If the state wants to hold school districts accountable for yearly progress, they must be given the necessary tools to increase student achievement. Currently, Washington State schools are funded by 70% taxes, 20% local levy taxes and bonds, and 10% by federal funds.

The tests given in Washington State were once known as the Washington Assessment of Student Learning (WASL), but as of 2009 it has been renamed as the Measurement of Student Progress (MSP) and the High School Proficiency Exam (HSPE). The MSP is taken in grades 3-8 and the HSPE is taken in the 10th grade. Students are tested in reading, writing, and math. All 10th graders must pass all sections of the test in order to graduate. Beginning in 2013, the state will add the science portion to the test.

One such school that is struggling to meet annual yearly progress and is currently facing sanctions is the Yakima School District located in Yakima, Washington. It is a school district that serves over 14,000 students that come from many ethnic backgrounds. It is also the largest Latino-majority district in the state serving approximately 64% Hispanics. Many are first generation immigrants who enter schools with limited English skills. Twenty-six percent are considered transitional bilingual and 22.7% qualify as migrant. The district also serves 77.6% of students who qualify for free or reduced-price meals.

According to Office of the Superintendent of Public Instruction (2009), an astounding 78.5% of 10th grade students in the Yakima School District did not meet the science standard and 76.5% did not meet the math standard. In 2008, 77% of students did not meet the science standard and 74.1 % did not meet the math standard. The data

shows that instead of test scores improving, they have declined the past two years. Many factors can contribute to why students are not passing the test, such as lack of resources, poverty, and language barriers. It is clearly evident that the school district must focus their attention on Hispanic students and the resources needed to increase student achievement.

According to the National Education Center (2008), the United States is lagging behind other countries in math and science as well. In 2006, the Program for International Student Assessment (PISA) was taken by 15-year olds in the United States and all over the world. Students in the U.S. scored less than average on these tests. Their performance on math was 474 and 498 in science (on a scale of 0-1000).

The government is responsible for ensuring that schools have the necessary tools to teach children the fundamentals on how to become productive and law abiding citizen. Without these tools, many jobs will go unfilled. Jobs that require strong math and science skills will be filled by people from other countries, or worse yet, these jobs will be transferred overseas.

Bilingual Education

In 1978, Washington State established the Transitional Bilingual Instructional Program (TBIP) to ensure equal opportunities for English Language Learners (ELL) in K-12 public schools. Both state and federal law require that schools provide specialized instruction to help ELL's access the academic curriculum. The state statute gives individual school districts broad discretion as to what programs they implement to serve

ELL's. The funding is from TBIP along with Title III monies. In order for school districts to qualify for this money, they must report which program they are implementing in their schools.

There are many types of bilingual programs that can be implemented in schools. The programs are designed to allow students to develop language proficiency in their native language and in English. According to the Washington State Commissioner of Asian Affairs (2010), the many different types of bilingual programs are:

- 1) Dual Language Programs: Allows students to develop language proficiency in their native language and in English. They are placed in a classroom where there are native English and native language speakers.
- 2) Developmental or Late-exit Bilingual Education: Emphasizes full bilingualism, instruction in English and the native language as the student progresses academically. Students typically stay in these programs for six years before they transfer to mainstream classes.
- 3) Transitional or Early-exit Bilingual Education: Emphasizes English language development with academic learning. Instruction is in the student's native language to teach both English and academic subjects. Students typically stay in these programs one-three years.
- 4) Dual Immersion Bilingual Education: Teaches Language English Proficient (LEP) and English proficient students each other's languages in order to develop full bilingualism for both sets of students.

- 5) English-as-a-Second-Language (ESL): Students are taught the English language with little or no use of their native language and is usually taught during specific school periods.
- 6) Structured Immersion: Teaches students simple English with little support from or use of the student's native language.

A research study conducted by Deussen & Greenberg-Motamed (2008) evaluated the Washington State Bilingual Program. The evaluation of the program was designed to gather and synthesize data from educators on how the Bilingual Program fulfills its responsibilities and delivers support to school districts. The committee's finding and recommendations reported that in order to support school districts who serve ELL students, there must be:

- 1) A clear articulated vision: This vision must be supported by the Bilingual Program, which defines the role of the program and ensures that the programs implemented are sufficient in meeting ELL' needs and that the staffing consists of highly educated teachers.
- 2) High-quality implementation with adequate resources: There must be sufficient financial resources to adequately fund the program and there must be a functional process for districts to apply for and receive Title III and bilingual funding. Staff must also have the appropriate preparation to deliver the selected model they implement while having the necessary time to evaluate student data. There must also be outreach programs for ELL families and communities.

3) Regular evaluation to ensure on-going improvement and accountability:

To establish and fund an accountability system that applies to all districts that receive TBIP funds and to revise reporting measures on how data is analyzed.

Based on these recommendations, Bilingual programs will operate in a more successful and effective manner. From their findings, it is evident that school districts that implement bilingual programs must have highly qualified teachers, the necessary resources, trainings, and the ability to assess student data to place them in an appropriate class/program.

Finding the necessary and highly qualified teachers to teach ELL's has been a challenge for many school districts. Research by Watson, Miller, Driver, Rutledge, & McAllister (2005) present the problems of a shortage of ELL trained teachers and that university textbooks are not preparing teachers on how to work with ELL's. Based on their findings, ELL issues are not a significant component of textbooks, therefore professors must supplement the information. With Hispanic's being the fastest growing minority group, it is essential that universities are preparing pre-service teachers with the necessary tools to work with minority students.

Support for Spanish Language and Supplemental Resources

Teachers who demonstrate the value of diversity, relationships, culture, and language in their classroom will see an increase in student achievement according to researchers Michael, Andrade, & Bartlett (2007). In their ethnographic study conducted in a New York City Bilingual High School, the results of the study stressed the importance of using Spanish as a resource and building relationships with the students in

order to have a successful program. Researchers Kenner, Gregory, Ruby, & Al-Azami (2008) also support the importance of diversity and the use of the student's first language. Language is linked to cultural identity. Social and emotional aspects can support educational achievement. They concluded in their research that bilingualism led to heightened metalinguistic awareness and extended bicultural knowledge. If students are not given sufficient support to develop their mother tongue, they are in danger of losing those advantages.

Extensive research has also been conducted in which the literature supports the use of the Spanish supplemental resources and the student's native language. Researcher J. Cummins (2000) defends his theory that literacy skills learned in the first language transfer to the second language. There is a direct correlation with language. If there is high competence in the first language, there will be high competence in the second language.

Many bilingual programs focus on elementary students since the majority of students who enter the school system are in grades K-5. Students are given approximately three years to transition into regular classes. Students who enter the school system in high school are given a year to transition out and must take the High School Proficiency Exam (HSPE) within six months of being in the United States. The HSPE is only given in English and student responses must also be written in English. Teachers are only allowed to review the directions in Spanish. That is it. Therefore, it is necessary that ELL's in high school get the appropriate resources in order to pass this high stakes test in order to graduate.

In her research, Westervelt (2007) discusses the importance of using Spanish supplemental resources and teaching science through the process of inquiry. Learner objectives also must be clearly taught in order for them to understand what is expected of them to learn.

Summary

In a time where the United States is currently dealing with immigration issues and bilingual programs are being threatened by English-only advocates, it is clear that the children are the stake holders as to how we will compete globally with other countries. If students are not given the necessary tools to increase academic achievement, we will fail as a country.

The extensive review of the literature took a close look at the Washington State bilingual system and the support that is needed in order for it to be successful. Colleges and universities must incorporate the drastic measures to make sure that pre-service teachers are given the appropriate educational practices when working with minority and ELL students. Teachers must also stand up and be advocates for these children to press for the appropriate resources, professional development, and trainings to evaluate student data to increase student achievement.

The literature review supports the use of the student's native language and also stresses the importance of valuing diversity and culture. The use of Spanish supplemental resources is also emphasized since research shows that students must learn the information in their first language before translating it into a second language. When using Spanish supplemental resources, the learner objectives must also be clearly stated so that students understand what they are expected to learn.

CHAPTER III

Introduction

The purpose of this project was to create chemistry Spanish supplemental resources to assist 9th grade English Language Learners in a bilingual physical science class. Chapter three contains background information describing: (1) rationale for the project and (2) procedures.

Rationale for the Project

The Yakima School District where the author teaches serves approximately 64% Hispanics. In 2008, the Office of the Superintendent of Public Instruction reported that 77.6% of 10th graders in the Yakima School District did not meet the state science standards. With a majority of Hispanic students in the district and 26% who are transitional bilingual and 22.7% who qualify as migrant, it is clear that there must be a focus on ELL students. ELL students have many disadvantages: 1) language barriers, 2) lack of adequately trained ESL teachers, and 3) lack of Spanish resources.

The idea to create chemistry Spanish supplemental resources for a 9th grade bilingual physical science class came when the author was assigned the bilingual class in the fall of 2008. The author had no background in bilingual education, but had seven years experience teaching high school science, is Hispanic, and bilingual in both English and Spanish.

Only equipped with science textbooks in English and a classroom of ELL's students with different English language proficiency levels, it was clear that this would be no easy task. The author made a request for Spanish textbooks and extra help. A paraprofessional was assigned to work one-on-one with the ELL's, but unfortunately there were no monies to purchase Spanish textbooks. The district informed the author of a partnership with the University of Mexico

through online classes known as CONEVyT. To better understand the educational system in Mexico and the background of the ELL students, the author was given the opportunity to attend a CONEVyT seminar in Guadalajara, Mexico in the winter of 2009. At the training, the author learned of the many opportunities that CONEVyT had to offer which are: 1) online classes in a variety of subject area including science, 2) laboratory experiments, 3) activities, 4) tests and quizzes, and lastly 5) a credit retrieval program with the Yakima School District. It was clear that CONEVyT would be an excellent resource to incorporate into the bilingual science curriculum.

In the summer of 2009, the author also attended a Full Spanish Immersion Institute from Washington State University for more professional development training. This institute focused on conversational Spanish with an introduction to the culture and its traditions. With the basic tools at hand, the author was ready to build the Spanish supplemental resources.

Procedures

In the spring of 2009, the author conducted an extensive literature review of professional resources to support the project. A variety of electronic sources were used to complete the review, including the Educational Resources Information Center (ERIC) and ProQuest Education databases, all available through the Central Washington University library. Descriptors such as “bilingual science education,” “supplemental Spanish resources,” “English Language Learners,” and “2nd language acquisition” were used to search for an appropriate balance of research, theory, and practice. It was apparent quite early on that there did not seem to be a great amount of research done on Spanish supplemental resources in the sciences, but the author did find a wide range of journal articles with useful and important information. The author also used bibliographies from the articles to search for other vital information.

After a review of the literature was compiled, the author began to develop the project. Materials were gathered and the author began to translate all the information to Spanish. The author also created many new documents such as laboratory experiments, practice problem worksheets, and power point presentations. It was also imperative that all resources contain the appropriate learner objectives that are aligned with the Washington State Learning Standards. Chapter four follows the actual project.

CHAPTER IV

The Project

The project is designed to be a supplemental resource for a bilingual physical science class that serves English Language Learners. The resources included consist of laboratory experiments, literature handouts, practice problem worksheets, and power point presentations. The resources are intended to be used as a supplement to the current curriculum.

The enclosed resources are numbered to match each topic. All the resources were written for English Language Learners in a bilingual physical science class. They are interpreted in Spanish and some resources contain both the English and Spanish language. It is assumed that most of the language is taught before and during the lessons, and carried throughout each topic.

The project is intended for ninth grade ELL students in a bilingual physical science class in the Yakima School District, specifically at Eisenhower High School. Each topic contains the student learner objectives in English and Spanish that are aligned with the Washington State Learner Standards for grades 9-12 in science. The Spanish resources are for a chemistry unit in the physical science curriculum. The project consists of eight subtopics. They are: 1) Seguridad del laboratorio (laboratory safety), 2) Método científico (scientific method), 3) El sistema métrico (the metric system), 4) Propiedades de la materia (properties of matter), 5) Átomos (atoms), 6) La table periódica (the periodic table), 7) Enlaces químicos (chemical bonds), and 8) Reacciones químicas (chemical reactions).

Each topic consists of the learner objectives, state learner standards, materials, and a description of the materials. The description describes each handout and materials that are needed for a laboratory experiment or activity. Many of the ideas are on-going activities and may involve several days or weeks to complete.

Chemistry Spanish Supplemental Resources

Table of Contents

The following table of contents is organized to correspond with the science lessons in the Teacher's Guide.

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Seguridad del Laboratorio

Learner objectives:

1. To understand the importance of laboratory safety when working in lab.
2. To be able to identify lab equipment and its appropriate name and use.
3. To be able to locate and operate safety equipment in lab.

Los objetivos de aprendizaje:

1. Entender la importancia de la seguridad en el laboratorio.
2. Ser capaz de identificar y como utilización el equipo del laboratorio.
3. Ser capaz de localizar y operar los equipos de seguridad en el laboratorio.

State learning standards:

9-12 INQA: Scientists generate and evaluate questions to investigate the world.

9-12 INQB: Plan and conduct a scientific investigation.

Collect, analyze, and interpret data.

9-12 INQC: Conclusions must be logical, based on evidence, and consistent with prior established knowledge.

9-12 INQD: The methods and procedures that scientists use to obtain evidence must be clearly reported.

9-12 APPB: Work collaboratively with other students to generate ideas for solving a problem.

Materials and description:

1. Contrato de seguridad científico Flinn para los Alumnos: Students will read about laboratory safety and sign a contract agreeing to the terms.
2. Examen de seguridad del laboratorio de ciencia: A test reinforcing the concepts of laboratory rules and safety.
3. Mapa de la clase: An activity for students to identify where certain materials are located in the classroom such as safety equipment and laboratory equipment.
4. Identificación de equipo de laboratorio: Students will become familiar with the laboratory equipment and its proper use.
5. Técnicas de Laboratorio: After students are familiar with the lab equipment, students will conduct a laboratory experiment on measuring technique and how to correctly use the Bunsen burner.

Please note:

This content has been redacted due to copyright concerns.

Chapter 4: Most pages for the project - except the introduction (page 20-21), table of contents and the References (pages 100-101) - have been redacted.

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CHAPTER V

Summary

This project was a Spanish supplemental resource for a 9th grade bilingual physical science class that serves English Language learners (ELL). The project's aim was to develop Spanish supplemental resources for a chemistry unit in a physical science class. To accomplish this purpose, an extensive review of current literature was undertaken. The literature review revealed the effectiveness and value of Spanish supplemental resources for ELL students. Each resource focused on maintaining high expectations, valuing the Spanish language, making connections with students, and respecting the Hispanic culture.

In the review, educational benefits for both teachers and students were described in using Spanish resources for ELL students to increase student achievement. For the review, the author developed the rationale, purpose, vocabulary and framework procedures to integrate the resources into the current curriculum.

Conclusions

The Spanish supplemental resources are an excellent teaching tool when working with ELL students. It is imperative that ELL students receive the information in their native language before being able to interpret it into a new language. Many of the resources contain hands-on activities such as laboratory experiments where students get to explore the concepts that are introduced for each chemistry unit. There are also several worksheets that are bilingual in English and Spanish to encourage the use of the English language and to familiarize them with the terminology.

The author has found that using the Spanish resources has worked extremely well with English Language Learners. The students are more involved and feel comfortable with participating in activities because the handouts are in Spanish. As their confidence level goes up, their academic achievement also goes up.

Recommendations

In a time where school districts are faced with budget deficits but yet still required to meet annual yearly progress without the appropriate programs, change must take place. Students are required to pass the HSPE or face not graduating. In 2013, the state will add the science section in order to graduate. In the Yakima School District, there is an overwhelming number (77%) who are not passing the test. How will teachers get these scores up if school districts do not have the resources available to implement new programs to increase student achievement? How will ELL students be successful on the English only HSPE if they are required to take the exam after only being in the United States for six months? The answer is simple. There must be a rigorous recruitment of ESL teachers and providing adequate training for those who work with ELL students. It is also imperative that they be supplied with the appropriate resources in order to increase the success of these students.

The project fulfills several of the guidelines set forth by the Washington State Learning Standards for 9-12 graders in science. This project will continue to evolve as the author learns more on how to effectively teach and increase academic achievement for ELL students.

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