BELIZEAN PRIMARY SCHOOL TEACHERS'UNDERSTANDING OF ASSESSMENT; ASSESSMENT PRACTICES, AND USE OF STUDENT ASSESSMENT DATA

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BELIZEAN PRIMARY SCHOOL TEACHERS

UNDERSTANDING OF ASSESSMENT;

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LEARNING AND USE OF STUDENT

ASSESSMENT DATA TO GUIDE

THEIR TEACHING

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CHAPTER I

INTRODUCTION

Background

The system of primary education in Belize includes a church state partnership. In this partnership the Government of Belize pays the full salary of all the teachers in the primary schools while a denominational administration manages the school. These schools are known as grant aided schools. In addition to the grant aided schools there are also Ministry of Education and private schools. Ministry of Education schools are managed by the government and private schools are those schools that are not managed either by the government or a denominational management. For grant-aided schools it is the responsibility of the denominational management to ensure that school infrastructure is adequate, to employ teachers, and to oversee the general day to day operations of the schools. Private, denominational and Ministry of Education Schools are located throughout the country, which is divided into six districts: (a) Corozal in the north; (b) Orange Walk in the north; (c) Belize in the center; (d) Cayo to the west; (e) Stann Creek in the south; and (f)Toledo in the south.

In the entire nation of Belize there are 294 primary schools and 2,948 teachers. Teacher certification is not a requirement for employment in the teaching profession. Three types of teaching licenses can be obtained: (a) provisional, (b) special, and (c) temporary. Teachers who have the academic and professional requirements to teach at the different levels of the school system (early childhood, primary, secondary) are granted a full license. A provisional license is issued for an initial period not exceeding five years to a person who lacks some qualifications for a full license. A special license is granted under circumstances warranting the employment of persons on an indefinite basis without commitment to obtaining the necessary qualifications for a full license ("Ministry of Education," 2000).

The *Ministry of Education's Abstract of Educational Statistics* (2008/2009) reported that 42.5% of teachers who were teaching at the primary level had been exposed to some level of teacher training and 38.5% were fully trained. The remaining 19% had no teacher training. The Belize District is the district with the largest population of primary school teachers with 37.3% of its teachers fully trained, 39.6% with some level of training, and 23.1% with no teacher training.

"The Ministry of Education's policy on educational assessment is guided by the belief that assessment is an integral part of the teaching and learning process and that assessment practices have significant impact on and should enhance student learning" ("Ministry of Education," 2000, p. 185). In addition the handbook states that assessment should be focused on the different aspects of a child's development, should be meaningful and relevant, and must be structured to support ongoing acquisition of knowledge, skills and attitudes ("Ministry of Education," 2000).

Problem Statement

The problem of student underachievement on the Primary School Examinations (PSE) continues to be a challenge for teachers, schools and other stakeholders in education. According to the Ministry of Education (2000), national assessments such as the PSE provide data for monitoring the system and individual students.

The PSE certifies student achievement in English, math, science and social studies. Students are expected to perform at least adequately by scoring 50% and above in each of the four subject areas. The grade bands are as follows: (a) A (80-100%) excellent, (b) B (70-79%) competent, (c) C (60-69%) satisfactory, (d) D (50-59%) adequate and (e) E (49% and below) inadequate.

Analysis of past PSE results has shown that in 2005, of the 5,877 students who took the exams, 44% scored an average of 50% and below. In 2008, 22.7% of the students who sat the exams scored 50% and below ("Abstract of Statistics," 2008/2009). This indicates a 21.3% decrease in the number of students who scored 50% and below.

The primary school system of education in Belize encompasses a total of eight years of formal education, after which students are expected to have enough knowledge of the competencies and skills that would enable them to pass the PSE exam. Even though the results have varied from district to district and school to school, overall evidence has suggested that many students are not learning the content and skills they should learn in order to pass the exam with a satisfactory grade.

Problem Indicators

Since, at the end of their eight years of primary school, so many students fail the exams, the emergent reason for concern is whether students were promoted from one class to the next without satisfactorily mastering the content at the previous level. Each student who enters primary school should be supported to perform to his or her maximum potential. Educators in the Belizean education system, especially teachers, are all accountable for ensuring that students are learning. If the teaching/learning process is monitored and supported, it could help teachers to reflect on their teaching and to use the data that they gather from assessment, not only for records, report cards, principals or parents, but also to interpret them and use the results to plan content and strategies to enhance student learning (Brunner, Fasca, Heinze, Honey, Light, Mandinach, & Wexler, 2005). "The goal of assessment is to promote student learning; not simply to document or measure it" (Paratore & McCormach, 2007, p. 8).

If the curriculum is designed according to students' needs and it is effectively implemented in the schools, then children should be able to demonstrate proficiency on the exams. Since examination results have indicated that students are performing below a satisfactory grade, this warrants scrutiny of teachers' assessment practices and what happens after they collect student assessment data at each level.

With more than half of the primary school teachers not fully trained, it might be realistic to suggest that teachers simply lack the knowledge and skills to develop a system for assessing and documenting students' progress and using the information to inform future instruction. Hoover (2010) stated that the benefit from assessments is not only to measure the students' achievement, but also how the assessment data is used to achieve improvement. "Assessment as a tool for enhancing learning should be a critical component of teachers' instructional planning, and should provide multiple and varied ways for students to show what they know and are able to do" (Hammerman, 2009, p. 110).

Implications of Examination Results

Analyses of the PSE results have raised concern regarding whether teachers know how to properly assess students, how to interpret the assessment results and how to make adjustments to their teaching in order to increase the level of learning for all the children. This question continues to puzzle the country's educational stakeholders as year after year almost half of the students who take the national exams do not demonstrate adequate performance. Examination results continue to show that students are not mastering the required competencies and skills at the end of the eight years of primary school. According to information sent to schools from the country's Examination Unit, the tables of specification outlining the items for the exam are based

on the concepts and skills outlined in the content standards of the national curriculum. Since many of the students have scored less than average, this has raised issues of concern.

Hoover (2010) stated that teachers struggle and experience pressure to document their students' achievements through mandated testing if they fail to recognize the formative nature of assessment and instead consider assessment to be separate from instruction. Teachers must use the results that they get from student assessment as a tool to improve their instruction. Assessments for learning should be regarded as formative assessments. Teachers should use the data gathered from a variety of assessment strategies to gauge student learning and to gain information to modify instruction according to students' particular needs. If this is done at each level in primary school, then more students would master the required competencies and skills to pass the exam. Kadel (2010) stated that effective use of data demands that the data be current. It must not be weeks, months or semesters old. He further explained that access to current data allows for consideration of where each student is at that present moment, what it would take for that student to reach curriculum standards, and what types of exercises are required to reach the desired goal. Stiggins, Arter, Chappuis, and Chappuis (2004) stated that the knowledge that teachers get from current assessment is of great benefit because it allows them to adopt their instruction based on the evidence they received which would yield immediate benefits to student learning.

Meeting grade level expectations for the required competencies and skills during primary school sets the foundation for students' successful transition through high school as well as their personal and professional growth. Statistics from the Ministry of Education *Abstract of Education Statistics* (2008/09) indicated that of the 4,000 students who entered first form at the high school level (9th grade in the U.S.), only 40% moved on to second form (10^{th} grade). A

comparison of the U.S. and Belize systems was shown by Lewis (1998), Appendix A. The remaining 60% of the students either repeated their first year in high school or became high school dropouts. It is assumed that one of the factors that might have influence on this is the lack of knowledge and skills students should have acquired during primary school.

According to the Ministry of Education (2000):

> One of the national educational goals of Belize is to ensure that all children are given the opportunity to acquire the knowledge, skills and attitudes required for full and active participation in the development of their community and for their own personal development. (p. 109)

If students are to experience personal development and participate in the full and active development of their country, then teachers must ensure that students have learned what they are supposed to have learned by the end of each class level. If teachers skillfully use assessment, they can motivate students who are not motivated, restore the students' desire to learn, and encourage students to keep learning (Stiggins et al., 2004). The end result of this can be an increase in student achievement.

Meeting the National Goal

In an effort to equip students to achieve the goal of personal development and full and active participation in the development of their country, the laws of Belize make it mandatory for all children between the ages of five and fourteen to attend at least eight years of primary school. Teaching and learning in primary schools throughout the country are guided by a national standardized curriculum, developed by the Ministry of Education.

The Ministry of Education (2000) states:

> The primary school curriculum focuses on four fundamental principles, which inform and guide all decisions and activities in primary education. These include: (1) education, which ensures that the learner learns to learn and is able to cope in a changing world, (2) the learner should be respected, be viewed as a unique individual, and the teaching and learning should focus on what is good for the individual, (3) education should aim at preparing the learner to be productive and to interact harmoniously in the social and physical environment, and (4) the learner has the potential for intellectual, physical, social, emotional and spiritual development and artistic creativity and expression. (p. 109)

Teaching and learning that support this principle promote all aspects of the child's development as embodied in the national educational goals. To complement the national curriculum, a national textbook program provides free textbooks to all students in primary schools. All Ministry of Education and grant aided schools are mandated to use the textbooks provided by the free textbook program.

In an effort to address the concern of inadequate student performance on the PSE, both the Ministry of Education and school managements have become more involved in the overall management and monitoring of schools. Attention is focused on how the Ministry of Education and school managements operate and their system of supervising, monitoring and supporting the delivery of education throughout the country. The Ministry of Education has been heavily criticized for the low level of professional and technical support that it offers to schools and other educational institutions. *The Education Act* (2000) mandates that the Ministry of Education must "provide support systems for the effective delivery of appropriate and equitable educational

services at all levels of the education system" (p. 11). Therefore, the Ministry is legally obligated to provide sufficient support.

Educational stakeholders acknowledge that students must successfully complete primary and secondary school in order to acquire some of the knowledge and skills that could equip them to seek further education or to enter the work force if they are to actively participate in the development of their community and for their own personal development.

History of Teacher Education in Belize

The history of teacher training in Belize has progressed from one institution offering teacher preparation courses to many institutions offering teacher preparation courses to in-service and pre-service teachers. Prior to 1954, no institutions offered formal training for teachers in Belize. In 1954 two colleges were established: St. John's Teachers' College under Roman Catholic management and St. George's Teachers' College managed by the government. These colleges offered programs for primary school teachers only. In 1965, the two colleges merged to form the Belize Teachers' Training College (BTTC). Upon successful completion of their program teachers were awarded a trained teachers diploma. This program consisted of a three-year certificate in teaching, which included two years of course work and one year of internship (Thompson, 2008). Teachers with a trained teacher's diploma had 1,545 hours of course work, 45 hours of practice teaching, 45 hours of research, and one semester of internship.

Between 1965 and 2000, Belize Teachers' Training College was the only institution offering teacher education programs for primary school teachers. In 1992 the World Bank and the United Kingdom government funded an educational project to increase the number of trained teachers who were teaching at the primary level. The project was called the *Three Year Certificate with School Experience*. It was designed to produce a rapid increase in the number of

trained teachers and was organized into two levels. The first level (Level I) was offered by distance learning over two and a half years (Bennett, 1999). Teachers who successfully completed Level I did 780 hours of course work, 78 hours of practice teaching and one semester of internship.

In August 2000, Belize Teachers' Training College lost its monopoly on teacher education when it merged with four other tertiary level institutions (University College of Belize, Belize Teacher's Training College, Belize Technical College, Belize School of Nursing, and Bliss School of Nursing) to form the national university; the University of Belize (UB). UB then offered a bachelor's degree in primary education. The course content for the bachelors' degree in primary education include: 132 completed semester credit hours of teacher education courses and one semester of internship. After the amalgamation junior colleges throughout the entire country were authorized by the government to offer teacher education courses in an effort to meet the demand for trained teachers. Since 2003, several junior colleges offered Associate Degree programs in teaching for primary school teachers and also a certificate in education. At these colleges, the Associate's Degree in Primary Education is essentially a three-year program. The course content, credit hours and semester of internship for the associate's degree program are the same as that of the trained teacher's program. The major differences in the two programs were that the associate's degree program did not have a research component. Similarly the course content and credit hours for the level I training and the certificate in education are the same except that courses for level I were offered by distance while the courses for certificate in teaching are offered face to face.

Purpose of the Study

The purpose of this study was to examine whether teacher training of primary school teachers significantly impacted their understanding of assessment, their practices for assessing student learning, and their use of assessment data to guide their teaching.

Research Questions

This study investigated the following research alternative hypothesis:
Teacher training of primary school teachers significantly impacts teachers' understanding of assessment, their practices for assessing students' learning and their use of assessment data to guide their teaching. The following research questions were developed in order to test the hypothesis of the study.

Research Question 1

Did differences in teachers' understanding of assessment exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or level I training; and
- no teacher training.

With regard to this question, the following research null hypothesis was developed.
H_{01}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education, held a certificate in primary education or level I, or had no training, in their understanding of assessment.

The independent variable was level of teacher training (master's degree in education, bachelor's degree in primary education, trained teacher's diploma, associate's degree in primary education, certificate in primary education or no training) and the dependent variable was teachers' understanding of assessment.

Research Question 2

Did differences in teachers' practices in assessing student learning exist among teachers with various levels of training? Five levels of training were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or level I training; and
- no teacher training.

With regard to these questions, the following research null hypothesis was developed. H_{02}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education, held a certificate in primary education or level I, or had no training, in their practices for assessing student learning.

The independent variable was level of teacher training (master's degree in education, bachelor's degree in primary education, trained teacher's diploma, associate's degree in primary education, certificate in primary education or no training) and the dependent variable was practices for assessing student learning.

Research Question 3

Did differences in teachers' use of assessment data to guide their teaching exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or level I training; and
- no teacher training.

With regard to these questions, the following research null hypothesis was developed.

H_{03}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate held an associate's degree in primary education, held a certificate in primary education or level I, or had no training, in their use of assessment data to guide their teaching.

The independent variable was level of teacher training (master's degree in education, bachelor's degree in primary education, trained teacher's diploma, associate's degree in primary education, certificate in primary education or no training) and the dependent variable was use of assessment data to guide teaching.

Definition of Terms

The following terms and their definitions are provided to facilitate understanding of the words and phrases that are used and discussed in the study and provide a frame for consistent interpretation of the terms throughout the study.

*Achievement***:** what has been learned as a result of instruction in the schools (Ysseldyke, I988, p. 9).

Assessment: the planned process of gathering and synthesizing information relevant to the purposes of: (a) discovering and documenting students' strengths and weaknesses, (b) planning and enhancing instruction, or (c) evaluating progress and making decisions about students (Phyne, 1997, p. 10).

Classroom Assessment: various assessment methods and tools that may provide a comprehensive, rich, and multi-dimensional account of what students know and may serve as instructional tools (Even, 2005, p. 47).

Criterion Referenced Tests: tests designed to determine whether an individual has learned specific skills or knowledge as measured against specified standards ("Ministry of Education," 2000, p. 188).

Data-Driven Decision Making: teachers systematically collect and analyze various types of data, including input, process, outcome and satisfaction data, to guide a range of decisions to help improve the success of students and schools (Marsh, Pane, & Hamilton, 2006, p. 1).

Denominational Schools: schools which are owned by religious denominations ("Ministry of Education," 2000, p. 44).

Formative Assessment: on-going assessments, reviews, and observations conducted in the classroom to improve instructional methods and provide students with feedback throughout the teaching and learning process (Zacharis, 2010, p. 61).

Ministry of Education Schools: schools which are owned and fully funded by the Ministry of Education and whose staff are employees of the Ministry of Education ("Ministry of Education," 2000, p. 44).

Primary School: a school recognized by the Ministry of Education as providing instruction and training suited to the abilities and aptitudes of children between the ages of five and fourteen years ("Ministry of Education," 2000, p. 33).

Primary School Examinations (PSE): national examination administered by the Ministry of Education to students at the end of primary education to determine achievement in relation to the primary school curriculum ("Ministry of Education," 2000, p. 31).

Summative Assessment: includes those measures designed to assess student mastery of instructional objectives. These are usually administered at the end of a unit or course of study. ("Ministry of Education," 2000, p. 190).

Assumptions of the Study

The researcher assumed that teacher training influenced teachers' understanding of assessment, their practices for assessing students' learning, and their use of assessment data to guide their teaching. A second assumption was that subjects did not communicate with each other about the survey and gave individual responses to the statements on the survey instrument.

Summary

Assessment is a necessary component of teaching and learning. It is only by assessing student's outcomes that teachers are able to make judgments on effects of their teaching and level of student learning. According to *The Education Act* (2000), the Ministry of Education "is charged with the responsibility of ensuring that all Belizeans are given the opportunity to acquire knowledge, skills, and attitudes required for full and active participation in the development of the nation" (p. 109). This can only be achieved if meaningful teaching and learning take place in the primary schools. Teachers' use of assessment data may enable them to better measure student learning, diagnose learning difficulties and share students' progress with stakeholders.

Consequently children need to be educated to participate in the development of their nation. The focus should be shifted from looking at the summative results of students' performance on the national standardized exam taken as students leave primary school and redirected to the results of formative assessments.

This study addressed the current state of teachers' perceptions of assessment at the primary education level, and how teacher training has impacted their assessment practices and use of assessment data. In addition, results from this study may also impact Ministry of Education policy decisions regarding teaching and learning in primary school

CHAPTER II

LITERATURE REVIEW

Introduction and Background of Assessment Practices in Belize

Assessment is one of the most crucial elements that teachers need to master if they are to be successful in establishing an environment that promotes teaching and learning. Even if effective assessment poses challenges, the educational benefits are worth the efforts because it could translate into increased learning. To yield improvements in teaching and learning, it is imperative that teachers understand the academic ability of their learners and plan to take them to the next level.

Assessment in Belize includes both classroom assessment and national assessments and examinations. The classroom assessments are guided by the internal policies of the school and include all the strategies that the teachers use to collect evidence on students' learning, and aim to improve learning and instruction leading to certification of students by schools. National assessments and examinations consist of centrally developed standardized measures that cover selected content that reflects national standards and expectations for specific curriculum areas. The national assessments and examinations are designed to monitor the education system and subsystems nationally, for certification of schools and monitoring individual student achievement ("Ministry of Education," 2000).

In order to monitor the education system and subsystems nationally, certify schools and monitor individual student achievement, students take two national standardized exams during their eight years of primary school. All students are required to participate in national assessments. The first is the Belize Junior Achievement Test (BJAT). This test is taken at the end of standard three (Grade 5) and children's competences in Math and English are tested. The

test is developed and marked by the Quality Assurance Development Services of the Ministry of Education (QADS) and is administered by the schools ("Ministry of Education," 2000).

At the end of standard six (Grade 8) and after at least eight years of primary school; students take the Primary School Examinations (PSE). Assessment at this level is a criterion-referenced examination that certifies student achievement in four subject areas: English, mathematics, science and social studies. This test is administered to all students in standard VI. The test is developed, administered and marked by QADS. Primary schools are required to show that their students are proficient in these subject areas, as demonstrated by their scores on the PSE ("Ministry of Education," 2000).

At all other levels of the primary school system assessments consist of teacher-made, teacher-administered, and teacher-marked instruments and tasks according to nationally determined guidelines.

A large body of literature on assessment is available which emphasizes the importance of assessment in the teaching and learning situation. This chapter examines current research on assessment and its influence on teaching and learning. The review will discuss the following topics that are relevant to this research study:

- purposes of assessment;
- theoretical framework for data driven decision making;
- components of data driven decision making skills framework;
- teachers' knowledge of assessment;
- instructional impact of teachers' assessment practices; and
- teachers' use of assessment data.

Purposes of Assessment

Assessment has been shown to be the single most important component that influences student learning and education in general (Taras, 2008). "The primary purpose of classroom assessment is to inform and precipitate improvement in teaching and learning" (Paratore & McCormach, 2007, p. 7). According to Phyne (1997), assessment is the planned process of gathering and synthesizing information relevant to three different purposes. These include discovering and documenting students' strengths and weaknesses, planning and enhancing instruction, or evaluating progress and making decisions about students.

As reflective practitioners, teachers use a variety of classroom assessment strategies, to part of an ongoing process, to collect evidence of students' performance. Inevitably, part of their professional practice requires teachers to constantly collect information about students, which leads to the development of insights about students' progress and judgments about specific learning outcomes and overall performance (Rea-Dickins, 2004).

An assessment gives a snapshot about what students know and are able to do at a particular time (Ayala, Shavelson, Ruiz-Primo, Brandon, Yin, Furtak, Young, & Tomika, 2008). Good assessments include information from a variety of sources such as tests, journals, reports, oral presentations, and observations that provide a broader perspective of the student performance and done to improve instructional methods and provide student feedback throughout the teaching and learning process (Heritage et al., 2009; Rea-Dickins, 2004; Zacharis, 2010). Assessment includes all the different means used by a classroom teacher to figure what the students are getting and what they are not getting, with the purpose of informing teaching and learning (Anderson, 2003; Gareis, 2007). In addition, assessments give a clear indication of areas of difficulty (Hosp & Ardoin, 2008). Students, teachers, and sometimes parents, need

information about what comes next in the learning process as well as continuous evidence of a student's location in the learning progression. To know what comes next in the learning process, one must know where the students presently are in their learning (Stiggins & DuFour 2009). Assessing students is a critical role that each classroom teacher plays in determining students' learning and grades. Classroom assessments should be used to help students learn; therefore, results should be used to monitor and promote individual students' learning (McMillan, Myran, & Workman, 2002).

Many researchers support formative assessment to improve student learning. According to Hamilton, Halverson, Jackson, Mandinach, Supovitz, and Wayman (2009), assessments serve multiple functions in instruction and learning, are multifaceted and are an effective strategy for improving learning.

Assessment results can also be used to improve instruction as they provide opportunities to examine teaching practices (Shepard, 2000). Teachers use judgments from the assessments to evaluate the effectiveness of their own teaching and to inform students and parents about student progress (Rea-Dickins, 2004). Formative assessments benefit teachers since effectively using the results may motivate students to learn, because it can build their confidence, and helps them to take responsibility for their own learning (Clark, 2008; Stiggins & DuFour, 2009). Furthermore, decisions that are made regarding instructions are more informed because the assessment information is more accurate (Stiggins, 2002).

Accuracy is beneficial to students because it helps to advance their learning by assisting teachers in making informed instructional decisions and plans that cater to individual strengths and weaknesses (Even, 2005; Hosp & Ardoin, 2008; Popham, 2006; Shepard, 2000; Stiggins & DuFour, 2009). Information gathered is used to guide daily instruction and help determine the

next learning steps for individual students. Assessment supports learning because it allows teachers to adapt instruction on the basis of evidence, making changes and improvements that can yield immediate benefits to student learning (Black & Wiliam, 2010; Chappius & Chappius, 2008).

Assessment provides evidence that "informs instructional decisions in ways that maximize student learning" (Stiggins et al., 2004, p. 14). According to Hosp and Ardoin (2008), assessment is needed to make decisions about what to teach and how to teach it. They further explained that decisions about what to teach had to do with when students have met or have not met grade level expectations, with the purpose of increasing the students' learning. Decisions about how to teach include identifying types of strategies and instruction that will be provided to help increase learning. Assessments is considered to be formative because information is used during the teaching and learning process and the results are used to make decisions about what actions to take to promote further learning by meeting the needs of the students assessed (Popham, 2006).

Zacharis (2010) stated that assessment must be frequent and used to improve instructional methods and to provide student feedback throughout the teaching and learning process. Domscheit-Chaleff (1996) identified assessments of students' current academic performance levels as critical to instruction and declared that assessment data should focus on individuals' academic strengths and weaknesses so teachers can do better planning. It informs, enhances and supports the learning process (Clark, 2008). Formative assessment provides timely results and enables teachers to quickly adjust their instruction while learning is in progress. "Assessments become formative assessments when the evidence is actually used to adopt the teaching to meet students' needs" (Stiggins et al., 2004, p. 11).

Classroom assessment promotes reflective practice on the part of teachers and provides an opportunity for them to reflect on their teaching and to make informed changes to their instruction. These changes may include more assessments, changing classroom activities or teaching style, modifying presentations and reviewing new material, and increasing communication and collaboration with students (Steadman, 1998). Frey and Schmitt (2007) pointed out that one of the purposes of formative assessment is to provide feedback so that the teacher can assess the quality of instruction being provided or to improve teaching behaviors. Gareis (2007) supported this concept by stating that the results of all types of assessment should inform instructional decisions; therefore, a central responsibility of teachers is to gather information about students' learning. According to Threlfall (2005), assessment information is used formatively as it affects the learning experiences of the student.

If formative assessment is effectively used, it can provide teachers and students with the information they need to move learning forward. Formative assessment and the teaching and learning process must be viewed as inseparable and teachers must recognize that one cannot happen without the other (Heritage, 2007). McMillian (2001) stated that assessment is an essential part of instruction and should be viewed as a tool, not only to document learning but also to improve it.

Effective decision making is based to some extent on the ability of teachers to understand their students and to match actions with accurate assessments, thus making assessment critical to student's learning. In addition, Stiggins (2002) maintained that if current daily classroom assessments become powerful tools for learning, the result would be significant gains in student achievement. If teachers use students' assessment results in formative ways, an improvement in

learning will result and more students will demonstrate more than adequate performance on the PSE.

"Assessment must not be as an end in itself, but a process of facilitating instructional decision making and learning" ("Ministry of Education," 2000, p. 186). As a result, assessment is the center of teaching and learning and, for it to produce the desired effect of enhancing achievement, it must be done regularly and the results must be used to inform instruction (Kadel, 2010). Teachers must be able to "change data into knowledge, transform knowledge into wisdom and use wisdom as a guide to action" (Doyle, 2002).

Theoretical Framework for Data Driven Decision Making

This study was framed using the theory of Data Driven Decision Making (Mandinach, Honey, & Light, 2006). The theory of data driven decision making (DDDM) makes reference to how stakeholders in the school system use student data to make decisions to improve student academic success. "The conceptual framework for data driven decision making is founded on the notion of what it means for an educator to be data driven" (Mandanich et al., 2006). An assumption of the framework is that educators, regardless of where they are within a school system, have questions, issues, or problems for which data must be collected, analyzed, and examined in order to make informed decisions (Marsh, et al., 2006). Three types of instructional decisions are informed by assessment data; these include (a) moment-by-moment decisions, (b) short-term planning, and (c) long-term planning.

Moment-by-moment, decisions are made during instruction as teachers use questioning and informal observations to help determine the time to clarify information, to redirect instructions to deal with misconceptions, and to capitalize on students' insights to extend the lessons. Short-term planning decisions may involve teachers reviewing goals, questioning

students, or using samples of students' work to check their understanding. This process is recursive such that an insight from one day's questioning helps in shaping the direction of subsequent lessons. Long term planning decisions involve considerations for broader goals, development of major instructional units, design of student grouping arrangements, and determining how students' learning will be assessed (Shepard, 2000).

Ackoff (1989, as cited in Mandinach el al., 2006) states that in data driven decision making "data, information, and knowledge form a continuum in which data are transformed to information and ultimately to knowledge that can be applied to make decisions (p. 7). Mandinach et al. explained:

> Data exist in a raw state; do not have meaning in and of itself; therefore, can exist in any form, whether usable or not. Whether or not data become information depends on the understanding of the person looking at the data. Information is data that is given meaning when connected to a context. It is data used to comprehend and organize our environment, unveiling an understanding of relations between data and context. Alone, however, it does not carry any implications for future action. Knowledge is the collection of information deemed useful, and eventually used to guide action. Knowledge is created through a sequential process. In relation to test information, the teacher's ability to see connections between students' scores on different item-skills analysis and classroom instruction, and then act on them, represents knowledge. (p. 7)

Data driven decision making in teaching and learning provides opportunities for teachers to help students while they are still teaching them, as opposed to looking at the data after students have already moved on to a higher class.

Components of Data Driven Decision Making Skills Framework

Data driven decision making skills, classroom, school or district levels of the school system, and technology-based tools are components of the conceptual framework for data driven decision making.

Mandinach et al. (2006), identified six cognitive skills or actions as crucial to the decision making process: collecting and organizing at the data level, analyzing and summarizing at the information level, and synthesizing and prioritizing at the knowledge level. It is a revolving process.

When faced with an instructional issue, questions, or problem, a teacher needs to first determine the manner in which he/she will collect data and the types of data that might be useful in answering his/her questions. A teacher may need to collect data to better understand the problem. Next, the teacher must decide how to organize the data he or she has collected in a way that makes it relevant to the initial question and also in a way that makes it optimal in answering the question. An organizational scheme then should be created from the raw data before the data is analyzed for informational purposes. Analyzing data occurs at the information level and involves a summarization of all the accumulated information. The analyzed data is then synthesized at the knowledge level and the information is turned into knowledge. It is essential that the teacher synthesize all the available information. The final step in the process is for the teacher to prioritize the information to determine what is most important so that appropriate actions can be taken (Mandinach et al., 2006).

The outcome of this six-step process, moving from data to information to knowledge, is a well-mediated decision. At the final stage, the decision is implemented, or in some instances it may fail to be implemented. This can be because of different reasons including external factors

such as a lack of resources. Evidence of outcome or impact of data driven decision making is manifested in the results of the implementation. Depending upon the impact, the decision maker may decide that he or she needs to return to one of the six cognitive steps, thereby creating a feedback loop. This may require that the educator collect more data, re-analyze the information, or re-synthesize the knowledge. The feedback loop makes data-driven decision making an iterative process. It is a cycle of collecting data that leads to a decision, implementing that decision, determining the impact, and possibly considering the need to work through some or all of the six processes again (Mandinach et al., 2006).

Levels of the school system must be considered in data driven decision making because although the utility of the data may be embedded within a particular level, interactions across the levels are likely to exist. Decisions that are made at the building level will impact those decisions made at the classroom level, just as decisions made at the classroom level will impact decisions made at the building level. Consequently, decisions made at the different levels impact those at building level and either indirectly or directly affects what happens in the classroom.

Technology tools can be used to support, enable, and facilitate data-driven decision making. These tools have the potential to support data mining that is not possible without technology (Mandinach et al., 2006).

Teachers can use data they collect from assessment to inform their decisions related to planning and instruction, directly impacting student achievement outcomes. Applying the theory of data driven decision making can result in increased academic outcome for students because it requires teachers to systematically and continuously collect, organize, analyze, summarize, synthesize and prioritize data so that they can make informed decisions. If teachers become competent in learning how to interpret their students' assessment results and use the data they

collect to inform their instruction and planning, then many students will experience an increases in their learning. Assessment is therefore an essential part of the teaching and learning process.

Students who enter primary school should have an opportunity to perform to their maximum potential. Teachers in Belizean classrooms are all accountable to ensure that students are learning. If the theory of data driven decision making is applied, then teachers may be more deliberate in reflecting on their teaching and will use the data that they gather from assessment not only for records for report cards, or principals, or parents, but also to interpret them and use the results to plan strategies to enhance student learning. This would likely translate into improved performance on the PSE.

Exposure to teacher training should help teachers to acquire some of the fundamental principles and techniques of teaching. Collecting data is an integral part of teaching. If teachers are taught the basic principles of data driven decision making then they could be better equipped to make meaning from the information they collect and would know how to use that knowledge to guide instruction. Therefore, the more training teachers receive, the more competent they should be in collecting assessment data, turning the data into information and using the knowledge gained from the information to guide instruction. Understanding of assessment influences teachers' assessment practices and their use of assessment data. According to Brown (2004), teachers' perceptions of assessment have a strong influence on how they teach and what their students ultimately learn.

Data from a five year span (2004-2009) of Belizean PSE scores indicated that for three of the five years more than 40% of the students scored an average of 50 or below. ("Abstract of Statistics," 2004-2008).

Data-driven decision making requires skills and is a complex task. However, this theory can be applied to enhance student achievement outcomes. If teachers become competent in collecting, organizing, analyzing, summarizing, synthesizing and prioritizing data, and use the data to inform their instruction, this increases the probability that individual students' strengths and weaknesses can be identified and appropriately addressed. Equipped with knowledge from student data, teachers can make the adequate adjustments to their instruction to ensure that students experience academic success (Mandinach et al., 2006).

Teachers' Knowledge of Assessment

What teachers know and believe about assessment is a significant factor that influences their assessment practices and what they do with the data they collect from student assessment. Assessment literacy can be defined as an understanding of the principles of assessment (Popham, 2006; Stiggins, 2002). Assessment literacy requires the ability to gather dependable and quality information about student achievement and the ability to use that information effectively to maximize student achievement (Heritage, 2007; Stiggins, 2001).

Teachers who are knowledgeable about classroom assessments are more likely to use assessments effectively because they will be able to discriminate between strong and weak assessments and will also be more inclined to integrate assessment with instruction in order to use appropriate forms of teaching (McMillan, 2001). Probabilities that classroom assessments will be better increases as teachers are assessment literate, because those teachers will know not only what it is that constitutes a strong versus an weak assessment, but will also know what represents an accurate versus an inaccurate interpretation the data (Popham, 2006).

It is important that teachers have basic knowledge of assessment so that it can be used to help students learn. Gathering and use of assessment information and insights must be a part of the ongoing learning process (Shepard, 2000)

Instructional Impact of Teachers' Assessment Practices

Teaching and learning in primary schools throughout Belize is guided by a national standardized curriculum, developed by the Ministry of Education ("Ministry of Education," 2000). According to Brown (2004), teachers' conceptions of assessment can be understood in terms of their agreement or disagreement with the three purposes to which assessment may be put, i.e., improvement of teaching and learning, school accountability, and student accountability. In addition, Guskey (2001) pointed out that effectiveness in teaching is not defined by what teachers do but by what their students are able to do. Classroom assessments serve as a meaningful source of information for teachers, helping them to identify what they taught well and what they need to work on (Guskey, 2005).

Young and Kim (2010) asserted that teachers' assessment practices influence whether they use data to inform their instructions and/or how that data informs their instruction. This includes the usefulness, relevance and accessibility of the data and the teachers' content and pedagogical knowledge. Mokhtari, Rosemary and Edwards (2008) found that although educators spend significant amounts of time collecting assessment data, they do not take time or perhaps do not know how to organize and use data consistently and efficiently in instructional decision making. If data will inform instruction, then teachers must find time to organize the data they collect and use it in their future planning.

Assessments should be ongoing and inserted into the curriculum to close the gap in students' understanding by both teachers and students. According to Guskey (2007), quizzes,

tests, writing assignments and other assessments administered by teachers on a regular basis are the best guide to improve student learning. Assessments that are created and administered by teachers should be directly linked to instructional goals and provide immediate results that are easy to analyze at the individual student level. Murnane, Sharkey and Boudett (2005), in their study of how one school used student assessment results to improve instruction, found evidence that, during the analysis of student data, assessment helped in planning for instructional improvements.

To use assessments to improve instruction and student learning, teachers need to change their approach to assessment to make it more useful for themselves and their students, by ensuring that assessments are followed by corrective instruction and that students are given second chances to demonstrate success (Guskey, 2003). Many times change is met with resistance and the same can be expected if teachers are asked to make changes in the way they plan. "Many times teachers are reluctant to participate in or change their practice unless they see clear implications of how the change will improve instruction in their particular classrooms" (Smylie, 1989, p. 547). That is one of the main reasons why it is essential for teachers to see a direct connection between their assessment practices and student academic achievement.

Formative and informal assessments need to be part of the instructional process and, although it is important that students are able to demonstrate the knowledge they have gained from classroom instruction, the focus should be on learning for understanding. Classroom assessments should be primarily formative and should be aimed at helping students to take the next step in learning. Evidence about what students are understanding leads to instructional decisions about both individuals and groups (Shepard, 2000).

Risko and Walker-Dalhouse (2010) argue that classroom-based assessment is credibly used by teachers who are able to design the assessments based on instructional goals, their systematic and frequent gathering of data, and whether direct applications to instructional adjustments are made as necessary. Formal and informal assessments need to be part of the instructional process, and although it is important that students are able to demonstrate the knowledge they have gained from classroom instruction, the focus should be on learning for understanding (Kaftan, Buck, & Haack, 2006).

"Teachers who develop useful assessments, provide corrective instruction and give students second chances to demonstrate success, can improve their instruction and help students learn" (Guskey, 2003, p. 10). According to Means, Padilla, Deberger and Bakia (2009) data-informed educational decision making includes a set of expectations and practices around the ongoing examination of data, in order to determine the effectiveness of educational activities to improve outcomes for students. Effective data-informed decision making requires access to useful data and well-designed supports, such as leadership to model data use, and supported time for reflection on data. A continuous improvement perspective should be evident with an emphasis on goal setting, measurement, and feedback loops, so teachers can reflect on their programs and processes, relate them to student outcomes, and make refinements suggested by the outcome data. If data are to influence the quality of the instruction that students receive, teachers who work with students on a day-to-day basis need access to timely information relevant to instructional decisions and the skills necessary to make sense of student data reports (Gallagher, Means, & Padilla, 2008).

Since more than half of the primary school teachers in Belize are not trained, it might be realistic to say that they simply lack the knowledge and skills to develop a system for assessing

and documenting students' progress and using the information to inform their future instruction. On the other hand, for those teachers who have received some level of training, it will be useful to know how that has influenced their use of assessment data.

Teachers' Use of Assessment Data

Assessment results are critical to instruction and support the teaching/learning process (Domscheit-Chaleff, 1996). One of the reasons why students are not demonstrating competency on the national standardized exams could be that teachers are not using the data they collect from assessment to inform their teaching. If teachers skillfully use assessment, they can motivate students who are not motivated, restore the students' desire to learn, and encourage students to keep on learning by adjusting their instruction to fit the students' needs, resulting in increased achievement (Stiggins et al., 2004). Black and Wiliam (1998), in their review of assessment and classroom teaching and learning, concluded that formative assessment does improve learning. This makes it imperative that teachers have assessment data that is current. According to Gallagher, Means, and Padilla (2008), teachers need access to achievement data for the students they are teaching currently, so that decisions about instruction are informed by current information.

If assessment and instruction are closely linked, achievement measurement becomes integral to learning. Furthermore, tied to the curriculum, assessment will examine teaching and practice and, therefore, be more representative of meaningful tasks and subject-matter goals. Assessment tasks will increasingly provide worthwhile instructional experiences that illustrate the relevance and utility of the knowledge and skill that is acquired and their application to different settings (Glaser & Silver, 1994).

In addition, Petersen (2007) stated that the use of data can help teachers focus on student achievement. Teachers must recognize that not all data are the same and data collection and analysis are tools which must be properly used to be effective. Standardized test results can be useful for accountability purposes, but student progress must be measured on a far more frequent basis if the data are being used to inform instruction and to improve achievement. To be useful in this way, interim assessments must be tied to clear standards. Time must be taken to analyze the implications of student assessment results, to plan for how instruction should be modified, and to act on conclusions.

Using data to make decisions can have an extraordinarily beneficial effect because those decisions are based on informed reflection (Flowers & Carpenter, 2009). Assessment of students' work provides teachers with an opportunity to gauge how well their students have learned and how well they have been teaching the students (Zacharis, 2010). Assessment data should focus on students' academic strengths and weaknesses so teachers can use them to plan (Domscheit-Chaleff, 1996). "It is an empty exercise to assess student learning without providing a means to adjust teaching in response to deficiencies revealed through the information gleaned from that assessment" (Chun, 2010, p. 23). Data should launch a conversation about what is working, what is not, and what will be done differently as a result (Petersen, 2007). In addition, Guskey (2001) stated that tests and assessments provide essential feedback about students' learning progress and help teachers in identifying learning problems and offering guidance and direction for correcting problems. Teachers must view results from assessment in ways that help to identify what was taught well and what needs reinforcement or revision.

According to Stiggins and DuFour (2009), assessment, done well, represents one of the most powerful instructional tools available to a teacher with respect to promoting student

achievement. It can identify student understanding, clarify what comes next in their learning, and also ignite and become part of an effective system of intervention for struggling students. In addition, it can improve the instructional practice of teachers. Guskey (2001) stated that teachers must view the results from their assessments in ways that help them identify what was taught well and what needs reinforcement or revision. Formative assessment, by subsuming the use of feedback, becomes a process for promoting learning through the use of assessment information Taras (2008).

In Belize, the Ministry of Education's educational assessment policy is "guided by the belief that assessment is an integral part of the teaching and learning process" ("Ministry of Education," 2000, p. 185). "For assessment to function formatively, the results have to be used to adjust teaching and learning" (Black & Wiliam, 2010, p. 83).

In this study the researcher examined primary school teachers' use of assessment data. This is critical because the challenges of today's education system demand that educators at all levels of the system transform data into knowledge, and that knowledge into wisdom to guide their actions (Doyle, 2003).

Summary

The review of literature on assessment and teachers' practice and use of student assessment data shows how instruction and assessment are inseparable. A teacher's understanding of assessment ultimately affects instructional practice. Experience does help teachers to identify and apply best practices; however, formal training plays a critical role in teacher effectiveness and student achievement. The purpose of assessment is to improve teaching and learning and teachers can improve their practice by applying the theory of data driven decision making.

This review of related literature informed how teacher training impacted teachers' understanding of assessment, their practices for assessing students' learning, and their use of assessment data to guide their teaching in Belizean primary schools. Using the components of data-driven decision making (Light et al., as cited by Mandinach et al., 2006), this study examined the effect of training on teachers data-driven decision making skills. The literature pointed to the purposes of assessment, instructional impact of teachers' assessment practices, and teachers' use of assessment data.

Assessment is an important part of teaching and learning. For classroom assessment to be used to make improvements in the classroom, it must be viewed by the teacher as an integral part of the instructional process and crucial for helping students learn (Guskey, 2003). Using assessment data to inform instruction helps to create a secure and inviting classroom in which students are respected and engaged in purposeful activities (Glaser & Silver, 1994). Empowering teachers to use assessment to improve their teaching, and to devise systematic approaches that integrate assessment to improve learning, will help with their practice. It will enhance the teachers' use of assessment for instructional decision making and pinpoint the standards of competent performance.

If teachers in Belizean classrooms are interested in reducing the number of students who graduate without acquiring the knowledge, skills, and attitudes required for full and active participation in the development of their community, and for their own personal development, steps must be taken to change the way teaching and learning is taking place. This includes monitoring the quality and effectiveness of education ("Education Act," 2000). Assessment data should be used to inform future planning because, in the final analysis, students' success should be the basic aim of teaching.

According to the literature, the purpose of assessment is to improve teaching and learning. It is argued that teachers' assessment practices and their use of assessment data are both linked to student achievement.

This literature review suggested that data driven decision making, teachers assessment literacy and practices and use of student assessment data can influence student learning. This study is designed to examine teachers understanding of assessment, their assessment practices, and use of their student assessment data.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this quantitative survey study was to examine teachers' understanding of assessment, their practices in assessing student learning, and their use of assessment data to guide their teaching. Specifically, this study sought to determine if the participant teachers' level of training had an impact on:

- teachers' understanding of assessment;
- teachers' practices in assessing student learning; or
- teachers' use of assessment data to guide their teaching.

This chapter addresses the methodology used to conduct the research.

Research Design

The study employed a non-experimental, cross sectional survey design. Data was collected from multiple groups of respondents at a single point in time and the independent variables were not manipulated (Johnson & Christensen, 2010). Descriptive statistics and analysis of variances (ANOVA) were used to determine if differences existed on a particular variable between five groups of respondents.

According to Gay, Mills, & Airasian (2009), quantitative research involves collecting and analyzing "numerical data to describe, explain, predict or control phenomena of interest" (p. 7). The research reported here examined factors that influenced Belizean teachers' understanding of assessment, assessment practices, and use of student assessment data to guide their teaching. This approach was chosen because, according to Creswell (2009), a quantitative approach is best

when a researcher seeks to identify factors that influence an outcome. A survey instrument was used to collect data.

The statements on the instrument aimed to gather information on teachers' understanding of assessment, their practices for assessing student learning, and their use of assessment data to guide their teaching with regard to differences that may exist among teachers with different levels of training. Survey research was used because it "determines and reports the way things are; it involves collecting numerical data to test a hypothesis or answer questions about the current status of the subject of study" (Gay et al., 2009, p. 9). This type of research was most applicable for this study because the researcher collected numerical data from teachers of different levels of training and examined teachers' perceptions with regard to different constructs related to assessment.

Research Focus

The study examined differences between level of teacher training and teachers' understanding of assessment, practices in assessing students learning, and use of student assessment data to guide their teaching. The overarching research focus was to find out whether teachers with more training had a greater and more positive understanding of assessment, whether they assessed their students more frequently and appropriately, and whether they reported more frequent use of assessment data in guiding their teaching than those teachers with less training. Three null hypotheses were developed.

The null hypothesis was developed stating that there were no significant differences between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education,

held a certificate in primary education or level I, or had no training, in their understanding of assessment practices and use of assessment.

The independent variables were levels of teacher training (master's degree in education, bachelor's degree in primary education, trained teacher's diploma, associate's degree in primary education, certificate in primary education, or no training) and the dependent variables were understanding of assessment, practices for assessing students' learning, and use of assessment data to guide instruction.

District Profile, Population and Sample

This study focused on primary school teachers in the Belize District in the center of the nation of Belize. At the time of this study, the district had 66 schools with approximately 18,057 students between the ages of 5 to 15+ enrolled. Thirty-nine of the schools were located in urban areas while 27 were in rural areas. The schools were managed by various agencies: (a) Government (7), (b) Roman Catholic (14), (c) Anglican (9), (d) Methodist (7), (e) Seventh Day Adventist (5), (f) Nazarene 1, (g) Assemblies of God (1), (h) Private (9) and (i) other (13) (" Abstract of Statistics," 2008/2009).

The total teaching force for Belize District Primary Schools was 834 teachers. All 834 teachers were invited to attend the annual general meeting of the Belize National Teachers Union, Belize Branch. However, only 475 teachers attended, thus the population for this study was all teachers employed in primary schools located in the Belize District who attended the annual general meeting of the Belize National Teacher's Union Belize Branch (N=475). Of the 475 attendees, 311 completed the survey for a 65% response rate.

Demographics data showed that 16% of the population of primary school teachers was male and 84% were female. Twenty three of these teachers had a master's degree in education,

70 held a bachelor's degree in education, 123 held a trained teachers diploma, 52 held an associate's degree in primary education and 37 held a certificate in education or Level I. In total 37.3 % of the teachers were considered fully trained while 39.6% had received some level of training ("Abstract of Education Statistics," 2008/2009).

Instrumentation

A survey instrument with a Likert-type scale consisting of a forced response format made up of 10 options per question was used to collect data on teachers' understanding of assessment, their practices for assessing student learning, and their use of assessment data to guide their teaching. Teachers were asked to select the response that best described how much they disagreed or agreed with each statement. Survey items were adopted from surveys originally designed by Frey (2009), Brown (2004) and Gates (2008). The researcher modified and condensed the three instruments into one instrument to fit the unique purposes of this study (Appendix B).

The survey instrument was divided into four sections. The introduction, Part I of the survey instrument, gathered information concerning teachers' understanding of assessment (knowledge and attitudes). Part II included a series of statements that examined teachers' assessment practices (behavior) and Part III of the survey instrument included statements on how teachers use the data they collect from assessment (behavior). The last part of the survey instrument solicited demographic information about the teachers' background characteristics such as their gender, age, years of experience, grade level that they were teaching, highest degree earned, subjects taught, and type of school agency for the school they taught.

Validity and Reliability of the Survey Instrument

The items on the survey were tested for both content and construct validity. According to Gay et al. (2009) content validity is "the degree to which it measures the intended content area" (p. 155) and the construct validity is the degree to which the items on the survey measure the intended hypothetical construct" (p. 157). Both content and construct validity of the survey instrument were tested by a group of four research professionals; primary school principals, and teachers from Belize not participating in the study. They reviewed the survey instrument and offered suggestions for clarifying terms and rephrasing survey items. Modifications to the questionnaire were conducted based on the feedback from research professionals, principals and teachers.

Gay et al. (2009) describe reliability as "the degree to which a test consistently measures whatever it is measuring" (p. 158). To check the reliability of the survey, the researcher conducted a pilot test and ran a Cronbach's alpha statistic to measure the internal consistency for the response data for each of the individual domains: understanding of assessment, practices in assessing student learning, and use of assessment data in guiding teaching

Pilot Testing the Instrument

Prior to the administration of the questionnaire to the subjects in the study, a pilot test was done which included the administration of the survey instrument to 30 teachers from the Corozal District with different levels of teaching qualifications. These teachers were not participants of the final study and were not on staff at the schools that provided the sample. The Cronbach's Alpha results for understanding, practice and use were all above the generally accepted level of 0.7 (Table 1).

Table 1

Cronbach's Alpha for Pilot Test

Domain	Number of Items	Alpha Reliability
Understanding	75	0.96
Practice	29	0.94
Use	15	0.96

The internal consistency of the items on the survey instrument for the 311 participants in the study was also assessed by calculating a Cronbach's alpha for each of the constructs: understanding of assessment, practices for assessing students' learning, and use of student assessment data to guide teaching. The Cronbach's Alpha for each was as follows: 0.97 for understanding of assessment, 0.93 for practices for assessing students' learning and 0.96 for use of assessment data to guide teaching. All were above the generally accepted level of 0.7 for reliability (Table 2).

Table 2

Cronbach's Alpha for Survey Instrument

Domain	Number of Items	Alpha Reliability
Understanding	75	0.97
Practice	29	0.93
Use	15	0.96

Protection of Human Subjects

Application for review of research with human subjects was submitted to the Oklahoma State University Institutional Review Board pursuant 45 CFR 46. Approval was granted to conduct this study by the Office of University Research Compliance on February 7, 2011 (Appendix C).

During the annual membership meeting of the Belize National Teachers' Union, Belize Branch, the researcher made a presentation to the teachers explaining the purpose of the study and the informed consent policies. Teachers were informed that they were free to ask questions or raise concerns. Disclosure included benefits and risks, confidentiality, contact information and researcher information. A cover letter accompanied the survey instrument and teachers consented by completing the survey (Appendix D).

To ensure participant anonymity, all surveys collected were assigned a code and the data were transferred into Microsoft Excel.

Data Collection

All primary school teachers in the Belize District who attended the annual general meeting of the Belize National Teachers Union Belize Branch on February 24, 2011 were invited to participate in the study (N=475), after the researcher made a presentation during the meeting and her explanation of the purpose of the study, and how the data would be collected and be used. At the end of the presentation, the researcher asked for volunteers to participate in the study. Survey instruments, inclusive of a cover letter explaining the purpose of the study and participants' rights were then distributed to teachers. All primary school teachers who were in attendance at the meeting were invited to participate in the study, 311 completed the survey for a 65% response rate. Each was given a survey instrument. Teachers who consented to participate in the survey completed the survey, while those who did not wish to participate returned the survey uncompleted.

The researcher collected the surveys at intervals during the meeting and at the end of the meeting. A total of 323 surveys were returned to the researcher. Of the returned survey instruments, 311 were fully completed while 12 were incomplete. The data from the completed

survey instruments were used in the results reported here while the data from the uncompleted surveys were discarded. The 311 completed survey instruments represented a 65% response rate.

Participation of at least 30% of teachers from the total population (N = 475) was acquired "to guarantee a desired representation of relevant subgroups within the sample" (Gay et al., 2009, p. 127); thus, with a population of 475, a sample of 311 resulting in a 65% response rate.

Data Analyses

Descriptive statistics and analyses of variances (ANOVA) were used to determine if differences existed on a particular variable between the five groups of respondents. The data were analyzed using Microsoft Excel software and Statistical Package for the Social Sciences (SPSS) 17.0. For the analysis the researcher calculated the sum of scores for each domain to obtain a total score for: understanding of assessment, practice in assessing student learning, and use of assessment data to guide teaching.

For each of the statements on the survey instrument, teachers had the choice of responding on a Likert-type scale of 1 to 10 with 1 being "strongly agree" and 10 being "strongly disagree." A 10-point scale was used in order to provide opportunities for respondents to be more specific with their responses and to increase variability (Polit, & Beck, 2008). To calculate the score for a subtest, the researcher added up the numbers selected by the respondent. However, responses to 16 of the statements were reverse scored because they were worded in the negative (15 items from the understanding of assessment subtest and one item from the practices in assessing student learning subtest) (Appendix E). For example, on the statement "Assessment is unbiased," if the respondent marked "1," this was translated to "10;" if the respondent marked

"2," this was translated to "9," and so on. Responses for practice statement 77 were also reverse scored.

To answer the three research questions that guided the study, the researcher used analysis of variance (ANOVA) to determine if differences existed among teachers with varying levels of teacher training in terms of their understanding of assessment, their practice in assessing student learning, and their use of assessment data to inform their teaching. For the ANOVA that resulted in a statistically significant *F* value (training and understanding of assessment), the researcher then used the Tukey honest significant difference (HSD) test (Morgan, Orlando & Gloeckner, 2001) to determine specifically where the differences existed.

Limitations of Study Design

Below are some limitations to the design and execution of this study:

- The Majority of the statements in the survey instrument dealt with teachers' understanding of assessment and formed Part 1 of the survey instrument. Respondents might have become tired after the first part due its length and perhaps not as perceptive with their responses.
- Not all primary school teachers in the Belize District were in attendance at the meeting. This might have been because not all teachers are financial members of the teacher's union and, even though being a financial member is not required for attendance at the meeting, it might be the determining factor for some teachers being absent. In addition, during that time there were issues of the teachers union calling for the resignation of a particular school board. Therefore, the findings cannot be generalized to the population.

- The method of convenience sampling created selection bias because the sample did not include an adequate representation of teachers from all the different levels of training.

Summary

This study used a survey design to examine the impact of primary school teachers' training on their understanding of assessment, their practices in assessing student learning and their use of assessment data to guide their teaching in primary schools in the Belize District. A survey instrument was administered and data were analyzed to ascertain whether differences of understanding of assessment, assessment practices, and use of assessment data existed among teachers with five different levels of training. Procedures for gathering and analyzing the data strictly adhered to the procedures required by the Oklahoma State University International Review Board. Approval was granted to conduct this research study by the University Research Compliance on February 7, 2011. The 311 completed survey instruments represented a 65% response rate. The data were analyzed by calculating the sum of scores for each domain (understanding of assessment, practice in assessing student learning, and use of assessment data to guide teaching) and using descriptive statistics and analyses of variances (ANOVA).

CHAPTER IV

FINDINGS

Introduction

This chapter begins with a review of the research focus and questions, and then moves to a description of the respondents' demographic information. The remainder of the chapter provides the results, analysis, and interpretation of the research data collected from the survey instrument that asked Belizean primary school teachers about their perceptions of assessment, their practices of assessing student learning, and their use of data to guide their teaching.

The study examined differences between level of teacher training and teachers' understanding of assessment, practices in assessing students' learning, and use of student assessment data to guide their teaching. Five categories of teacher training identified were:

- master's degree in education or bachelor's degree in primary education;
- trained teachers diploma;
- associate's degree in primary education;
- certificate in education or Level I training; and
- no training.

The overarching research focus was to determine if teachers with more training had a greater and more positive understanding of assessment, whether they assessed their students more frequently and appropriately and whether they reported more frequent use of assessment data in guiding their teaching than those teachers with less training. Specific research questions were examined in order to explore the overarching focus.

Three null hypotheses were developed as follows:

1. H_{01}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or Level I or no training in their understanding of assessment.
2. H_{02}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or Level I or no training in their practices for assessing student learning.
3. H_{03}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or Level I or no training in their use of assessment date to guide their teaching.

Three research questions were developed to test the null hypotheses relative to understanding of assessment, practices in assessing student learning, and use of assessment data to guide teaching.

Research Question 1

Did differences in teachers' understanding of assessment exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or Level I; and
- no teacher training.

Research Question 2

Did differences in teachers' practices in assessing student learning exist among teachers with various levels of training? Five levels of training were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or Level I; and
- no teacher training.

Research Question 3

Did differences in teachers' use of assessment data to guide their teaching exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or Level I; and
- no teacher training.

Response Rate

The population for the study was 834 teachers. Appendix F is Belizean primary school teachers' level of training. The convenience sample consisted of 475 primary school teachers from the Belize District, who had different levels of teacher training certification and taught either all or a specific subject or subjects. These teachers were in attendance at a Belize National Teachers Union meeting (Belize Branch). They were invited to participate in the study, and formed the sample. Each teacher present was given a copy of the survey instrument and 323

consented to participate in the study by completing the survey instrument. Three hundred and eleven of the instruments were fully completed and were used in the study while the 12 that were returned to the researcher with items left blank were not used in the study. The response rate (65% of the sample) and the size of the sample (37.3% of the population) add validity to the results of this study. Table 3 below is a comparison of the teachers' level of training in the population and in the sample.

Table 3

Comparison of Independent Variable of Targeted Population and Sample

Independent Variable	Targeted Population = N(834)		Respondents (311)	
	Frequency	Percent	Frequency	Percent
Some Level of training	330	39.6	161	51.8
No Teacher Training	504	60.4	150	48.2
Total	834	100.00	311	100.0

Demographic Data

A total of 311 primary school teachers with different levels of training were the respondents who completed the survey instrument. In total both male and female teachers varied in age, years of experience, highest degree earned, class level(s) taught, subjects taught, and type of school agency where they were teaching.

Teachers' demographic information was grouped into specific categories:

- Age (19-30 yrs., 31-40 yrs., 41-50 yrs., and 51+ yrs.).
- Years of experience (0-5 yrs., 6-10 yrs., 11-15 yrs., 16-20 yrs., 21-25 yrs., 26-30 yrs., and 31+ yrs.).
- Class level taught (Infant 1 to Standard I, Standard II to Standard III and Standard IV to Standard VI). The Belize primary school system comprises

eight years of formal education, i.e. Infant I and Infant II and Standards I through Standard VI.

- Highest degree earned (master's degree in education or bachelor's degree in primary education, trained teachers' diploma, associate's degree in primary education, certificate in teaching or Level I**,** and no training).
- Subject taught (all subjects or a specific subject or subjects). All subjects include: math, language arts, science, social studies, health and family life education, expressive arts, religion, and physical education.
- School agency (Roman Catholic, Methodist, Anglican, Government, Seventh Day Adventist, smaller denominations and private). Except for the government schools and the private schools, religious agencies manage all other schools.

Of the 311 respondents 86.5% were females, 39.9% (124) were age 30 years or less, and 7.7% (24) were age 50 or older. The majority of the respondents, (202 – 65%) reported having 10 years or less of teaching experience (Table 4).

Table 4

Respondents' Gender, Age and Teaching Experience

Selected Variables	Respondents	%
Gender		
Male	42	13.5
Female	269	86.5
Age		
19-30	124	39.9
31-40	108	34.7
41-50	55	17.7
51+	24	7.7

Experience		
0-5 yrs.	109	35.0
6-10yrs.	93	30.0
11-15 yrs.	23	7.4
16-20 yrs.	30	9.6
21-25 yrs.	24	7.7
26-30 yrs.	18	5.8
31+	14	4.5
Total	311	100.0

The respondents reported teaching at all levels of the primary system with 60% (187) teaching standard III or lower. The majority of the teachers, 88.7% (276), taught all subjects while 11.2 % (35) taught a specific subject or subjects (Table 5).

Table 5

Respondents' Class Level Taught, and Subjects Taught

Selected Variables	Respondents	%
Class Teaching		
Infant 1 to Std 1	119	38.2
Std II to Std III	68	21.9
Std IV to VI	124	39.9
Subject Taught		
All	276	88.7
A Specific Subject or Subjects	35	11.3
Total	311	100.0

The majority of the respondents (161) had no level of training. The teachers with Level I training formed the smallest group. Table 6 below is a comparison of the levels of training for the sample and respondents.

Table 6

Comparison of Level of Training Between Population and Respondents

Highest Degree Earned	Population	Respondents
Master's in Education	23	8
Bachelor's Degree in Primary Education	70	36
Trained Teachers' Diploma	123	36
Associate's Degree in Primary Education	52	36
Certificate in Education	18	32
Level I	19	2
No Training	193	161
Other*	336	0
Total	834	311

Note: Other includes certifications or academic qualifications (i.e. first Class teaching certificate, Diploma in Education etc.)

Two hundred and sixty-six (77.8%) of the respondents were teaching in schools managed by churches, 18 (5.8%) in schools managed by the government, and 27 (8.7%) in privately managed schools. Table 7 is a comparison of the respondents by groups along the selected variables.

Table 7

Respondents' School Agency

School Agency	Respondents	%
Roman Catholic	118	38.0
Methodist	63	20.2
Anglican	28	9.0
Government	18	5.8
Seventh Day Adventist	15	4.8
Small Denominations	42	13.5
Private	27	8.7
Total	311	100.0

Summary of Survey Instrument Responses

The survey instrument consisted of three parts. Part I of the survey instrument consisted of 75 statements that required teachers to gauge their understanding of assessment. All the statements were linked to a scale of 1 to 10, with 1 indicating *strongly agree* and 10 *strongly disagree*.

Sixty-one of the survey items that dealt with teachers' perceptions of their understanding of assessment were worded such that 1= *strongly agree* indicated that the respondent agreed with the statement about understanding of assessment. The remaining 14 statements (35, 54, 55, 57, 58, 60, 61, 62, 63, 64, 65, 73, 73, and 74 (Part I) and 2 (Part II) were worded just the opposite so that 10 = *strongly disagree* indicated that the respondents disagreed with the negative statement about understanding of assessment, and therefore had a positive response to the item. In order to make those 14 items comparable to the other items, they were reversed scored.

The researcher calculated a total understanding score by first reverse scoring the 14 items and then adding up the responses to all 75 statements concerning the respondent's understanding of assessment. The scores were also categorized and described for purposes of analyses. The sample's average score for understanding of assessment was 283.8, falling in the range of *good* (Table 8).

Table 8

Understanding of Assessment Scores (Part I of Survey Instrument)

Range of Scores	Description
75	Exemplary
76-150	Excellent
151-225	Very Good
226-300	Good
301-375	Above Average
376-450	Average
451-525	Slightly Below Average

526-600	Below Average
601- 675	Poor
676 and Above	Extremely Poor

Group's Total Responses (311 x 75 = 23,325)

Groups	Respondents	Mean	Description
MEd.or B.PEd.	44	274.5	Good
TT	36	288.1	Good
AA PEd.	36	245.6	Good
Cert.Ed. or Level I	34	266.0	Good
No Training	161	297.6	Good
Total	311		

Note. MEd. = master's in education; B. PEd. = bachelor's degree in primary education; AA PEd= associate's degree in primary education; Cert. Ed.= certificate in education

In Part I of the survey instrument, responses to the statements regarding understanding of assessment showed that teachers did indicate stronger agreements, or stronger disagreements, with specific statements. Teachers reported the strongest agreement average with the following statements:

- (#28) Assessment used a variety of methods (authentic, conferencing, written tests, oral presentations etc.).
- (#52) Assessment must be fair to children in terms of what was taught.
- (# 27) Assessments use a variety of materials (stimulus materials e.g. print, audio, video, test booklets etc.).
- (#37) Good assessments take time to create.
- (# 44) Assessment is a basis for grouping students for differentiated instruction.

Reported responses indicted strongest disagreement with the statements:

- (# 56) Assessments are too reliant on reading skills.

- (#58) Observational tools are better than tests.
- (# 65) Assessments measure higher order thinking skills.

In Part II of the survey instrument, teachers were asked to rate their instructional practice in assessing student learning by responding to 29 statements. All the statements were linked to a scale of 1 to 10, with 1 indicating *strongly agree* and 10 *strongly disagree*. Only one statement was worded just the opposite so that 10 = *strongly disagree* indicate that the respondents disagreed with the statement about understanding of assessment. The sample's average score for practices in assessing student learning was 103.99, falling in the range of *good* (Table 9).

Table 9

Practices for Assessing Students' Learning Scores (Part II of Survey Instrument)

Range of Scores	Description
29	Exemplary
30-54	Excellent
55-79	Very Good
80-104	Good
105-129	Above Average
130-154	Average
155-179	Slightly Below Average
180-204	Below Average
205- 229	Poor
230 and Above	Extremely Poor

Group's Total Responses (311 x 29 = 9019)

Groups	Respondents	Mean	Description
MEd.or B.PEd.	44	104.8	Above Average
TT	36	110.1	Above Average
AA PEd.	36	94.4	Good
Cert. Ed. or Level I	34	96.0	Good
No Training	161	106.2	Above Average
Total	311		

Note. MEd. = master's in education; B. PEd. = bachelor's degree in primary education; AA PEd.= associate's degree in primary education; Cert. Ed.= certificate in education

Responses to the statements in Part III of the survey instrument regarding practices for assessing students learning showed that teachers did indicate stronger agreements, or stronger disagreements, with specific statements. Teachers reported the strongest agreements with the following statements:

- (#3) As a teacher I am responsible for what students learn.
- (#4) My students know how well they are doing in my class.
- (#5) I articulate, in advance of my teaching, what I expect my students to know and be able to do at the end of a lesson.

The strongest reported disagreements were with the statements:

- (#2) Substantial learning occurs for all students regardless of their aptitude.
- (# 8) My assessment method is usually open-ended exams or quizzes or other assignments (e.g. short answers or essay items).
- (# 9) My assessment method is usually written assignments (e.g. essays, reports, journals).

Fifteen statements in Part III of the survey collected responses regarding teachers' perceptions of their use of assessment data in guiding their teaching. All the statements were linked to a scale of 1 to 10, with 1 indicating *strongly agree* and 10 *strongly disagree*. The sample's average score for practices in assessing student learning was 44.60, falling in the range of *good* (Table 10).

Table 10

Use of Student Assessment Data Scores (Part III of Survey Instrument)

Range of Score	Description
15	Exemplary
16-30	Excellent
31-45	Very Good
46-60	Good
61-75	Above Average
76-90	Average
91-105	Slightly Below Average
106-120	Below Average
121-135	Poor
136 and Above	Extremely Poor

Group's Total (311 x 15 = 4665)

Groups	Respondents	Mean	Description
MEd.or B.PEd.	44	46.9	Good
TT	36	46.7	Good
AA PEd.	36	36.7	Good
Cert.Ed. or Level I	34	41.8	Good
No Training	161	45.9	Good
Total	311		

Note. MEd. = master's in education; B. PEd. = bachelor's degree in primary education; AA PEd.= associate's degree in primary education; Cert. Ed.= certificate in education

Responses for the statements regarding practices for assessing students learning showed that teachers did indicate stronger agreements, or stronger disagreements, with specific statements. Teachers reported the strongest agreements with the following statements:

- (# 2) I use assessment to improve instruction.
- (# 6) I use assessment to let my students know how well they are doing in my classroom.

The strongest reported disagreements were with the following statements:

- (# 11) I frequently (on 80%) or more of all assignments, as well as during class) use assessment information to guide teaching.
- (# 12) I use assessment to monitor my instructional strategies to target understanding for all my students.
- (# 13) I use assessment to modify my instructional strategies to target understanding for all my students.
- (# 8) I use assessment to increase student motivation.
- (# 10) I use assessment to include students in their own learning.

The descriptive statistics for each section of the survey (understanding, practice and use) were calculated from the total responses in the survey instrument. Scores were analyzed to compare the means and standard deviations for each of the five levels of training groups. Only the 311 respondents who answered every question within a particular section were included in calculating the summary statistic. The mean scores indicate the level of understanding expressed by the specific groups. The lower the reported score, the higher was the level of understanding. The median shows the half-way point of the data set for the different groups. The standard deviation shows how close the group scores are clustered around the mean, indicating the level of agreement (low SD) or disagreement (high SD) within the group with regard to their responses (Tables 11, 12, and 13).

Table 11

Descriptive Statistics for Understanding Scores by Levels of Training

Variable	Respond-ents	Mean	Median	Mode	Standard Deviation
Understanding					
Master's Degree or Bachelor's Degree in Primary Education	44	274.5	252.5	233.0	104.0
Trained Teachers' Diploma	36	288.1	295.5	313.0	81.7

Associates in Primary Education	36	245.6	240.0	203.0	64.3
Certificate in Teaching or Level I	34	266.0	243.0	176.0*	98.5
No Training	161	297.6	276.0	294.0	88.7
Total	311				

Note: *Multiple modes exist. The smallest value is shown.

Table 12

Descriptive Statistics for Practice Scores by Levels of Training

Variable	Respond-ents	Mean	Median	Mode	Standard Deviation
Practices for Assessing Student Learning					
Master's Degree or Bachelor's Degree in Primary Education	44	104.8	95.5	53.0	45.2
Trained Teachers' Diploma	36	110.1	108.0	87.0	37.7
Associates in Primary Education	36	94.4	88.5	*65.0	32.0
Certificate in Teaching or Level I	34	96.0	88.5	67.0	39.1
No Training	161	106.2	105.0	112.0	34.4
Total	311				

Note: *Multiple modes exist. The smallest value is shown.

Table 13

Descriptive Statistics for Use Scores by Levels of Training

Variable	Respond-ents	Mean	Median	Mode	Standard Deviation
Use of Assessment Data					
Master's Degree or Bachelor's Degree in Primary Education	44	46.9	36.5	15.0	30.1
Trained Teachers' Diploma	36	46.7	45.5	30.0	20.9
Associates in Primary Education	36	36.7	35.5	15.0	16.9
Certificate in Teaching or Level I	34	41.8	37.0	15.0	26.4
No Training	161	45.9	45.0	*45.0	22.0
Total	311				

Note: *Multiple modes exist. The smallest value is shown.

Results of the descriptive statistics indicate that the mean and standard deviation for the respondents who held an associates' degree in primary education were the lowest in all three areas (understanding of assessment, practices for assessing students' learning, and use of assessment data to guide teaching). The standard deviation for the associates group's scores indicated that they were closer together compared with all the other groups; there was less variability in the scores for understanding, practices and use of assessment data. These respondents tended to answer the items in a similar fashion.

Results of Research Question 1

Did differences in teachers' understanding of assessment exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or Level I; and
- no teacher training.

The one-way ANOVA comparing the total scores for understanding across the five different levels of training suggests that a statistically significant difference existed among the groups (Table 14).

Table 14

ANOVA Summary Table for Understanding

	SS	df	MS	F	Sig.
Between Groups	98446.752	4	24611.688	3.109	.016
Within Groups	2422127.685	306	7915.450		
Total	2520574.437	310			

Note. F (4, 306) = 3.11, p = 0.016.

Post-hoc analyses using the Tukey-HSD procedure were performed to identify the specific difference. Results indicated that the difference was between the mean score of the associate's degree group and the group with no training (Table 15).

Table 15

Tukey HSD

	Mean A	Mean B	Difference in group means	Absolute Difference in group means	Critical VALUE*	Significant
MEd.or B.PEd. vs. TT	274.5	288.1	13.7	13.7	54.9	NO
B.PEd or MEd. vs. AA PEd.	274.5	245.6	28.8	28.8	54.9	NO
B.PEd or MEd. vs. Cert. Ed.	274.5	266.0	8.5	8.5	55.8	NO
B.PEd or MEd. vs. No Training	274.5	297.6	23.1	23.1	41.5	NO
TT vs. AA PEd.	288.1	245.6	42.5	42.5	57.6	NO
TT vs. Cert.Ed.	288.1	266.0	22.2	22.6	58.4	NO
TT vs No Training	288.14	297.6	9.5	9.5	45.1	NO
AA PEd. vs Cert.Ed.	245.6	266.0	20.4	20.5	58.4	NO
AA PEd. vs No Training	245.6	297.6	52.0	52.0	Critical VALUE*	Significant
Cert. Ed. vs. No Training	266.0	297.6	31.6	31.6	46.1	NO

Note. MEd. = master's in education; B. PEd.= bachelor's degree in primary education; AA PEd= associate's degree in primary education; Cert. Ed.= certificate in education

Results of Research Question 2

The second research question examined the differences in teachers' practices in assessing student learning. Specifically, Research Question 2 asked: Did differences in teachers' practices in assessing student learning exist among teachers with various levels of training? Five levels were examined:

- master's degree in education or bachelor's degree in primary education;
- trained teacher's diploma;
- associate's degree in primary education;
- certificate in primary education or Level I training; and
- no teacher training.

The one-way ANOVA comparing the total scores for practice across the five different levels of training showed no statistically significant difference among the groups. Post hoc analyses were not performed because the initial ANOVA results indicated no statistically significant difference among any of the groups (Table 16).

Table 16

ANOVA Summary Table for Practice

	SS	df	MS	F	Sig.
Between Groups	7641.018	4	1910.254	1.413	.230
Within Groups	413712.970	306	1352.003		
Total	421353.987	310			

Note. F (4, 306) = 1.41 p = 0.23.

Results of Research Question 3

The third research question sought to find out if differences in teachers' use of assessment data to guide their teaching existed among those teachers with:

One-way ANOVA results indicate that the groups' scores for use of assessment data to guide their teaching were not significantly different. Post hoc analyses were not conducted because the initial ANOVA results indicated no statistically significant difference among any of the groups (Table 17).

Table 17

ANOVA Summary Table for Level of Training and Use of Assessment Data

	SS	df	MS	F	Sig.
Between Groups	3176.961	4	794.240	1.476	.209
Within Groups	164697.798	306	538.228		
Total	167874.759	310			

Note. F (4, 306) = 1.48 p = 0.21

Results of ANOVA for Gender, Age, and Experience

In addition to examining teachers' perceptions about assessment in light of their level of training, the researcher also elected to examine the impact that gender, age or experience might have had on the teachers' views about assessment, their practices for assessing student learning and their use of assessment data to guide their teaching. ANOVA results in Tables 18 to 26 indicated no significant difference.

Table 18

ANOVA Summary Table for Gender and Understanding

	SS	df	MS	F	Sig.
Between Groups	5006.430	1	5006.430	.615	.434
Within Groups	2515568.008	309	8140.997		
Total	2520574.437	310			

Note. F (1, 309) = 0.62 p = 0.43

Table 19

ANOVA Summary Table for Gender and Practices for Assessing Students' Learning

	SS	df	MS	F	Sig.
Between Groups	3290.279	1	3290.279	2.432	.120
Within Groups	418063.708	309	1352.957		
Total	421353.987	310			

Note. F (1, 309) = 2.43 p = 0.12

Table 20

ANOVA Summary Table for Gender and Use of Assessment Data

	SS	df	MS	F	Sig.
Between Groups	1124.535	1	1124.535	2.084	.150
Within Groups	116750.224	309	539.645		
Total	167874.759	310			

Note. F (1, 309) = 2.08 p = 0.15

Table 21

ANOVA Summary Table for Age and Understanding of Assessment

	SS	df	MS	F	Sig.
Between Groups	1374.269	3	458.090	.056	.983
Within Groups	2519200.169	307	8205.864		
Total	2520574.437	310			

Note. F (3, 307) = .056 p = 0.983

Table 22

ANOVA Summary Table for Age and Practices for Assessing Students' Learning

	SS	df	MS	F	Sig.
Between Groups	5368.986	3	1789.662	1.321	.268
Within Groups	415985.001	307	1355.000		
Total	421353.987	310			

Note. F (3, 307) = 1.321 p = 0.268

Table 23

ANOVA Summary Table for Age and Use of Assessment Data

	SS	df	MS	F	Sig.
Between Groups	450.732	3	150.244	.275	.843
Within Groups	167424.027	307	545.355		
Total	167874.759	310			

Note. F (3, 307) = 0.275 p = 0.843

Table 24

ANOVA Summary Table for Teaching Experience and Understanding of Assessment

	SS	df	MS	F	Sig.
Between Groups	17451.388	6	2908.565	.353	.908
Within Groups	2503123.049	304	8233.957		
Total	2520574.437	310			

Note. F (6, 304) = 0.353 p = 0.908

Table 25

ANOVA Summary Table for Teaching Experience and Practices for Assessing Student's Learning

	SS	df	MS	F	Sig.
Between Groups	9671.049	6	1611.841	1.190	.311
Within Groups	411682.938	304	1354.220		
Total	421353.987	310			

Note. F (6, 304) = 0.353 p = 0.908

Table 26

ANOVA Summary Table for Teaching Experience and Use of Assessment Data

	SS	df	MS	F	Sig.
Between Groups	3064.863	6	510.811	.942	.465
Within Groups	164809.896	304	542.138		
Total	167874.759	310			

Note. F (6, 304) = 0.942 p = 0.465

Summary

Three hundred and eleven teachers from primary schools in the Belize District were surveyed and categorized into groups according to their level of training. Collected data were sorted and analyzed according to levels of training and gender using descriptive and ANOVA statistics. The teachers' level of training were master's degree in education, bachelor's degree in primary education, trained teachers diploma, associate's degree in primary education, certificate in teaching, Level I training, and no training.

ANOVA results indicated no statistically significant difference among the five levels of training groups in terms of their practices in assessing students' learning and their use of assessment data to guide their teaching; however, statistical analyses showed a significant

difference in the groups' understanding of assessment with the respondents from the group holding an associate's degree in primary education showing a significantly greater understanding than their counterparts with no formal teacher training (Table 14). The study failed to reject two of the hypotheses (H_{02} and H_{03}) and it rejected one (H_{01}).

CHAPTER V

CONCLUSION, DISCUSSION AND RECOMMENDTAIONS

Conclusions

A recurring challenge for all teachers, trained or untrained, is to learn how to increase academic performance for all students. Darling-Hammond (2009) stated that students' learning in the classroom is predominantly affected by teacher effectiveness. Accordingly, effective teachers use many different tools to assess students' learning and they use assessment information to help students advance from one level to the next in their learning (Sharkey & Murnane, 2003). Effective teaching cannot take place in the absence of assessment; therefore, in order for teachers to be effective in teaching they must find strategies to gather assessment data on student performance and use the results to increase students' learning.

The demand for accountability in students' learning continues to intensify. More and more, teachers are required to use a variety of strategies to meet the learning needs and styles of diverse learners. As the bar for higher student achievement continues to rise, educational stakeholders are not only demanding that students perform well on school level assessments but also that they demonstrate an adequate understanding of the curriculum competencies and skills as measured by their performance on national standardized exams. In Belize, primary schools are required to show that their students are proficient in English, mathematics, science, and social studies, as illustrated by their scores on standardized tests in the PSE. As schools struggle to meet the national standards, teachers are forced to find ways to respond and intervene in cases where students are not meeting required academic success levels.

Reflections on Problem Statement

Primary school students in Belize, who take the national standardized exams after at least eight years of primary education, have not been demonstrating that they have adequately grasped the curriculum content and skills that are tested on the exam. Even though the results indicate some upward spikes in performance for most of the subject areas in 2004, 2008 and 2010 ("Ministry of Education and Youth," 2011), the evidence suggests that, overall, many students are not passing the exam with a satisfactory grade.

There may be many reasons why students do not perform well on the exams. In addition to test anxiety, other reasons may include: validity and reliability of the test, types of test items, students' preparedness, and also the composition and scoring consistency between classroom assessments and the exams.

It is important that the exams are valid. They should measure what they are intended to measure. If they do not measure what they are intended to measure based on the content standards and learning outcomes in the curriculum, then it is possible that this would affect the students' performance. The exams must also be reliable; they must produce consistent results. The upward spikes in performance do not indicate that the results have been consistent.

Most of the items on the PSE exams are Multiple Choice. All the items for science, social studies, math paper one and English paper one are multiple choice while the English two and the math paper two are open ended. The high incidence multiple choice items may limit students' critical and creative thinking. Limiting the types of items to mostly multiple choice may have adversely influenced the performance of some of the diverse test takers.

Not all curriculum content and skills are tested on the exams but students need to be taught all and be adequately knowledgeable about them, so that they can demonstrate adequate

performance. If students did not adequately learn what was taught then it is possible that they would not perform adequately. In addition, many times what students are tested on are not completely aligned with the instructional content and objectives of the classroom.

The composition of the items on the exams and how they are scored may not be consistent with those used by the classroom teachers. Most classroom teachers do not give only multiple choice items but also use various types of items during classroom exams or tests. The multiple choice papers of the exams consist of 50 items. Teachers do not normally give that amount of items during classroom exams or tests. These factors could affect student performance. It would benefit students if the scoring of the exams is consistent with the scoring of classroom exams or tests.

Reflections on Hypothesis

Three null hypotheses were tested to see if there were statistically significant differences between teachers' level of training (master's degree in education or bachelor's degree in primary education, certificate in primary education, associate's degree in primary education, trained teachers' diploma or no teacher training) and teachers' understanding of assessment, practices for assessing student learning, and use of assessment to guide their teaching.

H_{01}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or level I or no training in their understanding of assessment. The null hypothesis was rejected by the data analysis (Table 14). The Tukey -HSD procedure refined the data analysis and identified the differences as existing between the respondents with an associate's degree in primary education and the respondents with no training (Table 15).

It was expected that there would not have been statistically significant differences between the three highest trained groups (master's degree in education or bachelor's in primary education, trained teachers, and associates in teaching) and the two other groups (certificate in teaching or level I, and no training). However, the researcher felt it necessary to test this expectation statistically. Since teacher certification is not a requirement to enter the teaching profession in Belize, the majority of teachers who enter the teaching profession get trained or upgrade their level of training while teaching in the system. It is highly likely that the respondents to the survey instrument who had a bachelor's degree in primary education or a master's degree have had some lower level of teacher training. It was therefore surprising that there was no significant difference in the average score between the group with the highest qualification and the other groups. In the case of the trained teachers they conducted an action research as a part of their course of study and thus it was conceivable that their exposure would have indicated a higher level of understanding of assessment. Teachers' understanding of assessment is an important part of the potentially interconnected set of teachers' instructional beliefs that affect students' learning outcomes.

H_{02}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or level I or no training in their practices for assessing student learning. This null hypothesis was accepted by the data analysis (Table 16).

Teachers are responsible for managing and monitoring students' learning. One of the ways this is done is through their assessment practices. Teachers' training should influence their practices for assessing student learning. It was expected that there would have been differences

to some extent in the practices for assessing student learning between all the groups that had some level of teacher training and the group that had no training. Since there were no differences, no Tukey- HSD procedure was necessary.

H_{03}: There is no significant difference between groups who held a master's degree in education or bachelor's degree in primary education, held a trained teachers' certificate, held an associate's degree in primary education or held a certificate in primary education or level I or no training in their use of assessment date to guide their teaching. This null hypothesis was accepted by the data analysis. Since there were no differences, no Tukey- HSD procedure was necessary.

A good understanding of assessment is essential to effective teaching and it is expected that teacher training should help teachers to develop their understanding of assessment. This should influence teachers to adopt positive practices for assessing students' learning and influence them to effectively use the data that they collect from assessment. Of the 311 teachers who participated in this study, 161 of them had no formal teacher training (Table 6). This is an area of concern. Teachers' lack of knowledge and skills to develop a system for assessing and documenting students' progress, and for using the information to guide their teaching, can create gaps in the teaching learning process, and under-achievement by students may not be effectively addressed. This can be one of the factors that contribute to students' inability to demonstrate that they have adequately grasped the curriculum content and skills, resulting in their low performance on the national standardized exams.

Conclusions Regarding Research Question 1

What teachers do on a daily basis in the classroom has major implications for student learning. Teacher training has a direct influence on student achievement; therefore, training

should help to equip teachers to be more effective in the classroom. Understanding of assessment is indispensable to the development of effective practices for assessing students' learning and in guiding teaching. When teachers understand assessment and its purposes, it propels them to engage in effective assessment-related activities. Such behavior could result in increased learning and student achievement (Block & Burns, 1976; Hosp & Ardoin, 2008; Light et al., 2004).

The study identified differences in understanding between two of the groups. Statistically significant differences were found in teachers' understanding of assessment between the group with an associate's degree in primary education and the group with no training (Table 15). The group with no training had the highest mean score (the higher the score, the lower the understanding of assessment) while the group with an associate's degree in teaching had the lowest mean score (the lower the score, the higher the understanding of assessment). In addition, the associate's degree group had the lowest standard deviation. This indicated that this group had the best understanding of assessment compared with all the other groups and their standard deviations were closer together. The group with no training had the highest understanding score which indicated that they had the lowest level of understanding compared with all the other groups. The group with a master's in education or bachelor's degree in primary education had the highest standard deviation which indicted that their scores were more widely dispersed than all the other groups.

Many factors could have contributed to the difference in the levels of understanding of assessment between the group of teachers with an associate's degree in primary education and the group with no training. During training, teachers are exposed to best practices on a regular basis. Assessment is interconnected with teaching, it has been the focus of recent trends in

education, and it is an essential part of the literature on education. Teachers with an associate's degree might have enhanced their technological and research skills and used available technological resources to explore best practices in teaching, which would most likely include student assessment. This could have favorably impacted their knowledge and understanding of assessment.

Courses in assessment form part of the professional core courses that students take while earning their associate's degree in primary education. Teachers who have had no teacher training would most likely not have been exposed to the content of those courses. This could explain the significant difference between the levels of understanding. In order for teachers to practice effective strategies for assessment of students learning and use the data to guide instruction, they must understand assessment and what it entails.

Teacher training institutions in Belize are now staffed with more qualified faculties. This could be another reason why the teachers in the associate degree program had a better understanding of assessment. Lecturers in training institutions probably align their course syllabi to reflect new trends and areas of focus relating to quality teaching and learning. As a result, the quality and relevance of content in assessment related courses may be better than in the past.

In Belize, the great majority of the staff who teach in the faculties of education at institutions that offer teacher training programs are not certified teacher trainers. This might help to explain the overall low levels of scores for understanding of assessment among the two groups of teachers with the highest training, whose scores fell in the range of *above average* and compared with the other groups with some level of training whose average scores were the same. In an effort to address and mitigate the issue of lack of qualified teacher trainers, the Ministry of

Education, in collaboration with other regional and international universities, continues to provide opportunities for Belizean teachers to access training.

Teachers' responses regarding understanding of assessment indicated the strongest agreements with the statements regarding variety of methods and materials, fairness, opportunities for differentiated instruction, and taking the time to create good assessments. From these responses to the survey instrument, it can be inferred that teachers feel strongly that good assessments take time to create and that students have a variety of learning needs and styles and, as such, assessment materials and methods must be diverse in other to better meet the needs of the students. In addition, indicating strongly that assessment must be fair in relation to what was taught demonstrated that they acknowledge that there must be some connection between their teaching and assessment.

The statements in the section of the survey instrument which dealt with understanding of assessment indicated teachers' strongest disagreement, also provided additional information regarding their understanding of assessment. Strongly disagreeing that assessments are too reliant on reading skills may be an indication that not all their assessments rely on reading skills. Strongly disagreeing that observational tools are better than tests may mean that they do not consider one type of assessment to be exclusively better than the other.

Understanding of assessment is important (Even, 2005; Kadel, 2010; Stiggins & DuFour, 2009; Zacharis, 2010). Evidence from training suggests that training programs have a positive impact on teacher confidence, knowledge, and skill in key areas of assessment (Lukin, Bandolos, Eckhout, & Mickelson, 2004).

The ability to adopt good practices for assessing student learning is dependent on understanding and perceptions of assessment and its benefits to teaching and learning. The

number of untrained teachers must be drastically reduced and teachers must complete teacher certification courses so that they have a better understanding of assessment. The mean understanding score for the entire group fell in the range of just above average understanding of assessment. This means that teachers' level of understanding of assessment should be improved. Understanding of assessment and its purposes drives teacher practices for assessing students' learning.

Conclusions Regarding Research Question 2

Training should enhance teachers' practices for assessing student learning. The fact that the results of this study indicate that for this research question there were no statistically significant differences could mean that teachers who have had some level of training might not have applied what they learned in theory to their practice, or that what they learned in their coursework was not useful to be adopted as a part of their practice.

The group mean for teachers' practice in assessing students' learning fell in the "average" range. If the goal of teaching is to ensure that students gain the necessary knowledge and skills, then effective practices for assessing student learning must be a part of the approach to teaching and learning by teachers.

Again, the means and standard deviations for practices in assessing students' learning were lowest for the group with an associate's degree in primary education. The lowest mean score indicated that this group had the best practices in assessing student learning compared and their scores were closer together. The group with a trained teachers' diploma had the highest practice score and the group with a master's degree in education or a bachelor's degree in primary education had the highest standard deviation.

Teachers' responses on the survey instrument regarding practices for assessing students' learning indicated the strongest agreements with the statements regarding being responsible for students learning, informing students of how well they are doing and informing students in advance about what they are expected to know and be able to do at the end of a lesson. From these responses it can be inferred that teachers feel strongly about the role they play in students' learning.

The statements with which teachers indicated strongest disagreement also indicated their positive assessment practices. They strongly disagreed that substantial learning occurs regardless of students' aptitude and that their assessment method is usually open-ended exams or assignments.

The responses from teachers can be related to their understanding of assessment. Research findings (Brown, 2004; Hosp & Ardoin; 2008; McMillan et al. 2002; Popham, 2003; Stiggins, 2002; Stiggins & DuFour 2009) support teachers' understanding of assessment as a critical component of teaching practice.

Conclusions Regarding Research Question 3

Use of student assessment data to guide teaching makes teaching more effective and accelerates student learning. Guskey (2003) stated that teachers need to learn how to make assessments useful. "To use classroom assessment to make improvements, however, teachers must change both their view of assessment and their interpretation of the results" (p. 172).

The results for teachers' use of assessment data to guide their teaching indicated that there were no significant differences among the groups. Teacher's overall responses indicated that they did not have a good, very good or an excellent understanding of assessment. This might have been one of the reasons that influenced their lack of use of assessment data.

The group with an associate's degree in primary education had the lowest mean score and standard deviation for use of assessment data to guide teaching. The lowest mean scores indicate that their data use was most effective compared to the other groups and the scores were closer together. The group with a master's degree in education or a bachelor's degree in primary education had the highest mean and standard deviation which indicated that they reported the least effective use of assessment data and their scores were the most widely dispersed.

The group with an associate's degree reported the highest mean score for all three areas (understanding, practice, and use) compared with all the other groups, and the group with the certificate in teaching or Level I had the second highest mean score. Both the associate's degree in primary education and the certificate in teaching are new programs and this can therefore be the reason for these groups having better understanding of assessment, more positive practices in assessing their student's learning and more effective use of data than all the other groups.

The highest qualified groups who had master's degrees in education or bachelor's degrees in primary education, had the highest mean scores for all three areas (understanding, practice and use) indicating that they had the least understanding of assessment, had the least positive assessment practices, and the least effective use of assessment data.

Teachers' responses regarding the use of assessment data to guide teaching indicated the strongest agreements with the statements regarding keeping students informed and using the data to improve their teaching. The statements that teachers indicated strongest disagreement with also show that teachers' had some challenges with the use of assessment data. They strongly disagreed that substantial learning occurs regardless of students' aptitude and that their assessment method is usually open-ended exams or other assignments.

Responses for the statements regarding practices for assessing students learning indicated that teachers did indicate stronger agreement regarding the frequency with which they use assessment data to guide their teaching, to monitor instructional strategies, to increase student motivation, and to include students in their own learning.

Data use for assessment is not a required course in any of the teacher training institutions but it should be seriously considered. Assessments can promote or improve learning if they are "planned and implemented as an integral part of the curriculum and program of instruction" (Glaser & Silver, 1994, p. 411). Assessments are of greatest value when they are constructed and selected in line with instruction and "results are available for formative planning and change" (Glaser & Silver, 1994, p. 411). Students can experience significant learning gains if classroom assessments are used as tools for teaching and learning (Guskey 2003; Stiggins, 2002).

Many research findings support the use of data in making decisions regarding instruction (Domscheit-Chaleff, 1996; Chun, 2010; Mandinach, Honey, & Light, 2006; Petersen, 2007; Zacharis, 2010). This research study was guided by the framework of data driven decision making. In order to drive that process, teachers must understand assessment, integrate practices for assessing students' learning in the core of their teaching, and use the information collected from assessment data to guide their teaching.

Significance of the Study

Student achievement should be the ultimate goal of teaching. Using student assessment data to inform instruction is an effective way to monitor and positively influence students' learning. In this regard, assessment can help teachers to improve both teaching and learning. According to Paratore and McCormach (2007), "the primary purpose of classroom assessment is

to inform and precipitate improvement in teaching and learning" (p. 7). In Belize, no studies have examined the relationship between teacher training and teachers' understanding of assessment, practices for assessing student learning, and use of assessment data to guide teaching. This study therefore adds to the body of literature. In addition, it expands the very limited research in Belize regarding teachers understanding of assessment practices.

By examining the impact of teacher training on teachers' understanding, practice and use of assessment data, the results of the study have practical and conceptual implications for teachers, principals, school managers, teacher training institutions and the Belize Ministry of Education. Practical implications include the acceptance of teacher candidates into the teaching profession, and professional development for teachers. Conceptual implications include teachers as data driven decision makers. Because this study is supported by the relevant literature, the results also contribute to teachers' knowledge of assessment, their practices in assessing students' learning, and their use of student assessment data.

The results also show the need for further training or professional development for teachers in the areas of assessment literacy, assessment practices and use of assessment data. This study also has practical implications for teacher training institutions by identifying the effects of different categories of training on teachers' assessment knowledge.

Limitations of the Study

The following factors and circumstances limited the results of this study:

1. The results of this study only represented the perceptions of primary school teachers in the Belize District who attended the annual general meeting of the Belize National Teachers' Union, Belize Branch and responded to the survey instrument. This non-random selection of the sample limited the generalizability of results.

2. This study was also limited in that it did not collect and triangulate data from students or principals with the data from teachers. Collecting data from these additional sources would have strengthened the validity of the study.
3. The validity and reliability of the data obtained in this study was perhaps limited by the willingness of the respondents to respond candidly to the statements on the survey instrument.

Limitation of the Findings

The following factors were limitations to the findings of the study.

1. The self-reported method used to respond to the statements on the survey instrument may be limited in that the teachers with no training rated themselves better than the other groups. This might have been because they "did not know that they did not know" (they may have the false belief that they are doing what they are supposed to be doing when that is not the case).
2. The method of convenience sampling may have created sampling bias and may have affected how closely the sample represented the population.

Implications for Policy and Practice

Based on the findings of this study and correlation with information from the literature on student assessment by teachers, the following recommendations are made to the Ministry of Education, school principals and administrators, and teachers.

Recommendations to the Ministry of Education

The Teacher Education and Development Services of the Belize Ministry of Education is responsible for approving all teacher education courses offered at institutions offering teacher training in Belize. Teacher training does have a positive impact on teacher confidence,

knowledge and skills in key areas of assessment (Lukin, Bandalos, Eckhout, & Mickelson, 2004). Teacher education programs must take the initiative in developing their students' skills, and improving their practice in assessing student performance (Impara, Plake, & Fager, 1993). Teachers' assessment practices significantly influence students' academic goals (Alkharusi, 2008) and, therefore, support must be provided to ensure that "testing and teaching interact to inform each other for the improvement of instruction and increase in academic achievement" (Glaser & Silver, 1994, p 405).

1. An associate's degree in primary education should be the minimum requirement for entry in the teaching profession.
2. Professional development opportunities should be provided for school principals and teachers on best practices in assessment and use of student assessment data to guide teaching.

Teachers who have a good understanding of assessment are more likely to adopt effective practices for assessing students' leaning and use of student assessment data to guide their teaching. Data driven decision making as an integral part of every level of the school system will result in more effective use of data, which could result in increased student achievement both on classroom assessments and on national standardized exams.

Recommendations to School Principals or Administrators

School principals and administrators can help to provide opportunities for teachers on their staff to improve their assessment practices and use of student assessment data. The following are some recommendations:

1. Have teachers with an associate's degree in teaching lead learning communities within the school to share ideas and best practices for assessment practices and use of assessment data.
2. Create opportunities for members of staff who are not trained to access an associate's degree in teaching program.
3. Provide professional development sessions for teaching staff to enhance their assessment skills and their knowledge of assessment, and for enhancing their assessment practices and use of data to guide their teaching.

Learning communities will provide opportunities for teachers to share expertise, information and best practices. These interactions with others will help them to reflect on what they do in their individual classrooms, and to refine or adopt best practices and strategies that would make them more effective in their practice. This could result in more learning for the students.

Recommendations to Teachers

Teachers' assessment practices and use of student assessment data have direct impact on students' achievement. The following are some recommendations:

1. Teachers without any formal training who have been shown to have the least knowledge of assessment and have least effective assessment practices should receive training in assessment.
2. Involve students in the formative assessment process. Students' input is critical to the formative assessment process. Students must be involved in the interpretation and analysis of assessment results and plans for the way forward. This will increase their academic achievement.

3. A strong knowledge of assessment will help teachers make sound decisions regarding what to teach and how to teach. In addition, the knowledge will help them in using information gathered from student assessment to plan for future lessons. Teachers' practices will be improved if they have a system of organizing and analyzing student assessment information. This will help them to interpret and prioritize what to do next. Teachers, as members of learning communities, will have access to support which would help them to cope with assessment challenges.

Recommendations for Future Study

The attitudes, knowledge and skills that teachers have concerning student assessment could be very useful in helping to improve student academic performance in the classroom, school, and by extension the country. Several recommendations for future study have emerged from this research study. Based on the results and the information gathered from the literature, the following recommendations are made:

1. More research to collect information on teachers' practices for assessing students' learning and use of assessment data to guide teaching, using observations, artifacts etc.
2. Additional research is needed to identify problems and issues that inhibit teachers' practices for assessing students' learning and their use of assessment information to guide teaching.
3. More research, particularly on teacher's data driven decision making skills, would help to bring about the improvements that are necessary to address challenges with teachers' assessment practices and their use of students' assessment data.

4. Failure to find significant differences with most of the levels of teacher training and understanding of assessment, practices for assessing students' learning, and use of student assessment data to inform future planning does not mean that these differences do not exist. Replication of this study can be done and instead of having teachers responding to close-ended statements they could be asked to report in an open-ended way.

Summary

The laws in Belize make it mandatory for all children between the ages of 5 and 14 to have access to primary education. Teachers are key players in our education system and are in strategic positions to initiate the change process so that we move from where we are now to a more data driven approach to instruction. Students should experience academic success at every level of the primary system and subsequently demonstrate adequate or above adequate performance on our national standardized exams. Each student should have the opportunity to learn and, more importantly, to perform to their maximum potential.

Training is critical to a teacher's practice as it fosters the development of best practices. Data driven decision making is a best practice in teaching. Mandanich et al. (2006) make specific reference to how people within the school systems, especially teachers, use data to make decisions to increase student achievement. Training will provide the necessary foundation for teachers to be more data driven. Brown (2004) in his study of teachers' conceptions of assessment found that teachers' views of assessment strongly influence how they teach and what the students learn. If teachers view assessment as critical to their teaching then their practice will reflect it. This would result in more effective teaching and meaningful learning.

Teachers in the Belizean education system are all accountable for student learning. Teachers should reflect on their teaching and use the data that they gather from assessment not only for report cards, and for the principal or parents, but also interpret them and use the results to plan strategies to enhance student learning. When this is accomplished students can contribute to a more productive workforce and by extension be productive citizens of our country. Productive citizens of Belize mean more competent citizens in the working sector of the county. This will propel a healthier economic development, which will result in a better standard of living for all Belizeans. Schools in Belize are holding the society together. If the proportion of trained teachers is increased it will improve the school performance (Gale, & Mortis, 2010). When schools' performance improved students will be better equipped to contribute to a better Belize.

REFERENCES

Alkharusi, H. (2008). Effects of classroom assessment practices on students' achievement goals. *Educational Assessment, 13(4),* 243-266.

Anderson, L. W. (2003). *Classroom assessment: Enhancing the quality of teacher decision making.* Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Ayala, C. C., Shavelson, R. J., Ruiz-Primo, M. A., Brandon, P. R., Yin, Y., Furtak, E. M., & Tomita, M. K. (2008). From formal embedded assessments to reflective lessons: The development of formative assessment studies. *Applied Measurement in Education, 21*(4), 315-334. doi:10.1080/08957340802347787.

Bennett, J. A. (1999). *Belize primary education development project. improving quality in the provision of education for all in Belize: An examination of the impact of a bacis education project.* Jamaica: Office of the UNESCO Representative in the Caribbean.

Black, J. H., & Burns, R. E., (1976). Mastery learning. *Review of Research in Education*. *4*, 3-49.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7.

Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 91*(1), 81-90.

Brown, G. L. (2004). Teachers' conceptions of assessment: Implications for policy and professional development. *Assessment in Education Principles Policy & Practice, 11*(3), 301-318.

Brunner, C., Fasca, C., Heinze, J., Honey, M., Light, D., Mandinach, E., & Wexler, D. (2005).Linking data and learning: The grow network study. *Journal of Education for Students Placed at Risk (JESPAR), 10*(3), 241–267.

Chappuis, S., & Chappuis, J. (2008). The best value in formative assessment. *Educational Leadership, 65* (4), 14-18.

Chun, M. (2010). Taking teaching to (performance) task: Linking pedagogical and assessment practices. *Change*, *42*(2), 22-29.

Clark, I. (2008). Assessment is for learning: Formative assessment and positive learning interactions. *Florida Journal of Educational Administration & Policy, 2*(1), 1-16.

Creswell, J. W. (2009). *Research design qualitative, quantitative and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications Inc.

Darling-Hammond, L. (2009). Teacher education and the American future. Journal of Teacher Education, *61*(1/2), 35-47.

Domscheit-Chaleff, C. (1996). From assessment to instruction: Sharing assessment data effectively. *Volta Review, 98* (5), 233.

Doyle, D. P. (2002). Knowledge-based decision making. *School Administrator*, *59*(11), 30-34.

Doyle, D. P. (2003). Data-driven decision-making. *T H E Journal*, *30*(10), 19.

Education Act (2000). Belize: Ministry of Education.

Even, R. (2005). Using assessment to inform instructional decisions: How hard can it be? *Mathematics Education Research Journal*, *17*(3), 45-61.

Flowers, N. & Carpenter, D. H. (2009). You don't have to be a statistician to use data: A process for data-based decision making in schools. *Phi Delta Kappan, 91*(2), 64-67.

Frey, B. B., & Schmitt, V. L. (2007). Coming to terms with classroom assessment. *Journal of Advanced Academics*, *18*(3), 402-423.

Frey, C. A. (2009). *Teachers' understanding and use of formative assessment strategies: A multiple embedded case study in K-12 urban ring schools of a mid-size city in Rhode*

Island (Doctoral Dissertation). Retrieved from ProQuest Dissertation and Thesis. (Order No. 3365829).

Gale, H., & Mortis, N. (2010). *Male social participation and violence in urban Belize: An examination of their goals, guns, gender, god, and governance*. Belize: Ministry of Education.

Gallagher, L., Means, B., & Padilla, C. (2008). *Teachers' use of student data systems to improve instruction: 2005 to 2007*. Washington, DC: U.S. Department of Education.

Gareis, C. R. (2007). Reclaiming an important teacher competency: The lost art of formative assessment. *Journal of Personnel Evaluation in Education, 20*(1/2), 17-20.

Gates, A. A. (2008). *Wyoming teachers' knowledge and use of assessment*. (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses. (Order No. 3320747).

Gay, L. R., Mills, G. E , & Airasian, P. W. (2009). *Educational research: competencies for analysis and applications*. Saddle River, NJ: Merrill Pearson.

Glaser, R., & Silver, E. (1994). Assessment, testing, and instruction: Retrospect and prospect. *Review of Research in Education, 20* 393-419.

Guskey, T. R. (2003). How classroom assessments improve learning. *Educational Leadership, 60*(5), 6.

Guskey, T. R. (2005). *Formative classroom assessment and Benjamin S. Bloom: Theory, research, and implications*. Paper presented at the annual meeting of the American Educational Research Association. Montreal, Canada.

Guskey, T. R. (2007). Closing the achievement gaps: Revisiting Benjamin S. Bloom's "learning for mastery". *Journal of Advance Academics, 19*(1), 8-31.

Guskey, T. R. (2001). Use test results as tools to improve teaching. *Education Digest, 66*(5), 25.

Hamilton, L., Halverson, R., Jackson, S. S., Mandinach, E., Supovitz, J. A., Wayman, J. C. (2009). *Using student assessment data to support instructional decision making. IES Practice Guide.* (NCEE2009-4067). National Center for Education Evaluation and Regional Assistance. National Center for Education, Evaluation, and Regional Assistance, U.S. Department of Education, Washington, DC.

Hammerman, E. (2009). *Formative assessment strategies for enhanced learning in Science, K-12.* Thousand Oaks, CA: Corwin Press.

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan*, *89*(2), 140-145.

Heritage, M., Kim, J., Vendlinski, T., & Herman, J. (2009). From evidence to action: A seamless process in formative assessment? Educational Measurement Issue and Practice, *28*, 24-31.doi:10.1111/j.1745/3992.2009.00151.x.

Hoover, N. (2010). A descriptive study of teachers' instructional use of student assessment data. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 70*(12-A), 4649.

Hosp, J. L., & Ardoin, S. P. (2008). Assessment for instructional planning. *Assessment for Effective Intervention, 33*(2), 69-77.

Impara, J. C., Plake, B. S., & Fager, J. J. (1993). Teachers' assessment background and attitudes toward testing. *Theory Into Practice, 32*(2), 113.

Johnson, B., & Christensen, L. (2010). *Educational research: Qualitative, quantitative and mixed methods (4th ed.)*. Thousand Oaks. CA: SAGE Publications Inc.

Kadel, R. (2010). Data-driven decision making--Not just a buzz word. *Learning & Leading with Technology, 37*(7), 18-21.

Kaftan, J. M., Buck, G. A., & Haack, A. (2006). Using formative assessments to individualize instruction and promote learning. *Middle School Journal*, *37*(4)44-49.

Lewis, G. (1998). *A national Approach to Touch Key Boarding Instructions in Primary Schools in Belize*. Unpublished doctoral dissertation, NOVA Southeastern University.

Lukin, L. E., Bandalos, D. L., Eckhout. T. J., & Mickelson, K. (2004). Facilitating the development of assessment literacy. *Educational Measurement: Issues and Practice, 23(2),* 26-32.

Mandinach, E. B., Honey, M., & Light, D. (2006). *A theoretical framework for data-driven decision making*. Paper presented at the annual meeting of AERA, San Francisco.

Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education* (OP-170-EDU). Retrieved from http://www.rand.org/pubs/occasional_papers/OP170.html.

McMillan, J. (2001). Integrating assessment with teaching. Guskey T. R. & Marazano, R. J, (Eds.), *Essential assessment concepts for teachers and administrators(p.1).* Thousand Oaks, CA: Corwin Press Inc.

McMillan, J. H., Myran, S., & Workman, D. (2002). Elementary teachers' classroom assessment and grading practices. *Journal of Educational Research, 95*(4), 203.

Means, B., Padilla, C., DeBarger, A., Bakia, M (2009). Implementing data-informed decision making in schools: Teacher access, supports and use. US Department of Education.

Ministry of Education (2000). *Handbook of policies and procedures for school services*. Belize: Ministry of Education.

Ministry of Education (2010*). Ministry of Education Abstract of Educational Statistics (2008/2009)*. Belize: Ministry of Education

Ministry of Education (2011). *Ministry of Education and Youth Press Release*. Belize: Ministry of Education.

Mokhtari, K., Rosemary, C. A., & Edwards, P. A. (2008). Making instructional decisions based on data: What, how, and why. *Reading Teacher, 61*(4), 354-359. doi:10.1598/RT.61.4.10.

Morgan, G. A., Orlando,V. G. & Gloeckner, G. W. (2001). *SPSS for windows. An introduction to use and interpretation of research*. Mahwah: NJ. Lawrence Erlbaum Associates Inc.

Murnane, R. J., Sharkey, N. S., &. Boudett, K. P. (2005). Linking data and learning: The grow network study. *Journal of Education for Students Placed at Risk, 10*(3), 269–280.

Paratore, J. R., & McCormach, R. L (2007*). Classroom literacy assessment: Making sense of what students know and do.* New York, NY: The Guilford Press.

Petersen, J. L. (2007). Learning the brave new world of data-informed instruction. *Education Next,* 36-43.

Phyne, G. D. (Ed.) (1997*). Handbook of Classroom Assessment Learning, Adjustment and Achievement*. San Diego, CA: Academic Press.

Polit, D. & Beck, C. T. (2008). *Nursing research. Generating and assessing evidence for nursing practice (5th ed.).* Philadelphia: PA. Litppimcoh Williams & Wilkins.

Popham, W. J. (2006). Assessment for learning an endangered species. *APS Mathematics Teacher*. *2*(7).

Popham, W. J. (2003). The seductive allure of Data. *Educational Leadership 60*(5) 58-51.

Rea-Dickins, P. (2004). Understanding teachers as agents of assessment. *Language Testing, 21*(3), 249–258.doi:10.1191/0265532204lt283ed.

Risko,V. J., & Walker-Dalhouse, D. (2010). Making the most of assessments to inform instruction. *Reading Teacher, 63*(5), 420-422.

Sharkey, N.S., & Murnane, R. J. (2003). Learning from student assessment results. *Educational Leadership*, *61*(3), 77-81.

Shepard, L. A., (2000). *The role of classroom assessment in teaching and learning. CSE Technical Report*. Los Angeles: CA. Center for Research on Evaluation, Standard and Student Testing.

Smylie, M. A. (1989). Teachers' views of the effectiveness of sources of learning to teach. *Elementary School Journal*, *89*(5), 543-558.

Steadman, M. (1998). Using classroom assessment to change both teaching and learning. *New Directions for Teaching and Learning*, (75), 23-35.

Stiggins, R. J. (2001). The unfulfilled promise of classroom assessment. *Educational Measurement: Issues and Practice*, *20*(3), 5-14.

Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. *Phi Delta Kappan*, *83*(10), 758.

Stiggins, R., & DuFour, R. (2009). Maximizing the power of formative assessments. *Phi Delta Kappan*, *90*(9), 640-644.

Stiggins, R. J., Arter, J. A., Chappuis, J., & Chappuis, S. (2004). *Classroom assessment for student learning: doing it right, using it well*. Portland, OR: Assessment Training Institute.

Taras, M. (2008). Assessment for learning: Sectarian divisions of terminology and concepts. *Journal of Further and Higher Education, 32*(4), 389-397.

Thompson, C. T. (2008). *The role of early experience in the development of a professionally knowledge- based and identity as a teacher: Investigating teacher preparation in Belize*

(Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses. (Order No. 3340768).

Threlfall, J. (2005). The formative use of assessment information in planning the notion of contingent planning. *British Journal of Educational Studies, 53*(1), 54-65.

Young, V. M., & Kim, D. H. (2010). Using Assessments for instructional improvement: A literature review. *Education Policy Analysis Archives, 18*(19).

Ysseldyke, S. (1988). *Assessment in special and remedial education*. Boston, MA: Houghton Miffin Company.

Zacharis, N. Z. (2010). Innovative assessment for learning enhancement: Issues and practices. *Contemporary Issues in Education Research, 3*(1), 61-69.

APPENDIX A

Grade/Age Comparisons of Belize and US Education Systems

	Belize	Age	US	
	Preschool	3-4	Preschool	
	Kindergarten	5	Kindergarten	
	Infant I	6	Ist Grade	
	Infant II	7	2nd Grade	
PRIMARY	Standard I	8	3rd Grad	ELEMENTARY
	Standard II	9	4th Grade	
	Standard III	10	5th Grade	
	Standard IV	11	6th Grade	
	Standard V	12	7th Grade	MIDDLE
	Standard VI	13	8th Grade	
	1st Year	14	9th Grade	
	2nd Year	15	10th Grade	
SECONDARY	3rd Year	16	11th Grade	HIGH SCHOOL
	4thYear	17	12th Grade	
	6th Form	18	Jr. College	
TERTIARY	and	19	Jr. College	
	University	20+	College/ University	

Source: Gilda Lewis (unpublished doctoral dissertation)

APPPENDIX B

Teacher Survey Instrument

Part I: Understanding of Assessment

Directions: This questionnaire assesses your understanding of assessment. There are no right or wrong responses. Use the rating scale below to select the option that best reflects how much you agree with the statement by placing a tick in the box below the appropriate option to the right of each statement.

	Statement	**Response**											
1	Assessments confirm teacher judgments.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
2	Assessments evaluate how students are performing.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
3	Assessments evaluate how schools are performing.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
4	Assessments provide useful external reference point for future teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
5	Assessment results measure teacher effectiveness.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
6	Assessment results measure school effectiveness.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
7	Assessments describe components of student performance using standards.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
8	Assessments describe components of performance using a criterion.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
9	Assessments compare students to one other.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
10	Assessments describe students' abilities.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
11	Assessments identify what students know.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
12	Assessments establish what students have remembered.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

13	Assessments describe or identify what level students are at based on what they are learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
14	Assessments identify student strengths.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
15	Assessments identify student weaknesses.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
16	Assessments provide diagnostic information.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
17	Assessments, informed by criteria determine how much students learned from teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
18	Assessment is a process of collecting information for reporting to students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
19	Assessment is a process of collecting information for reporting to parents.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
20	Assessment is a process of collecting information for improving teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
21	Assessment is a process of collect information for improving learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
22	Assessment is a process of collecting information for accountability to students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
23	Assessment is a process of collecting information for accountability to parents.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
24	Assessment is a process of collecting information for accountability to	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

	school administration.												
25	Assessments allow valid inferences about student's ability to meet learning objectives.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
26	Feedback from assessments should be communicated to students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
27	Assessments use a variety of materials (stimulus materials e.g. print, audio, video, test booklets, etc.).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
28	Assessments use a variety of methods (authentic, conferencing, written tests, oral presentations etc.)	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
29	Formative assessment is carried out using multiple techniques.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
30	Assessment is multi-faceted.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
31	Assessment is standardized.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
32	Assessment is objective.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
33	Scoring of assessments determines whether the assessment focuses on deep or surface learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
34	Assessments have to be systematically carried out.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
35	Assessment is unbiased.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
36	Consistency is important in assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
37	Reliability is important in assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
38	Good assessments take	Strongly	1	2	3	4	5	6	7	8	9	10	Strongly

	time to create.	Agree	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Disagree
39	Continuous assessment is better than one off.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
40	Assessment is integrated with teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
41	Assessment is integrated with the curriculum.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
42	Testing and teaching use similar activities.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
43	Assessment aids planning by providing feedback to teachers.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
44	Assessment helps the teacher to determine what additional learning is required by providing feedback on student learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
45	Assessment is a basis for grouping students for differential instruction.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
46	Assessments exemplify learning by determining to what extent students have learned specific skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
47	Assessments exemplify learning by determining to what extent students have learned specific knowledge.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
48	Assessments exemplify student performance by diagnosing student strengths.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
49	Assessments usually aim at improvement of learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
50	Assessments usually aim at improvement of	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

	teaching.												
51	Assessment is unfair because it is not a full picture of student ability.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
52	Assessments must be fair to children in terms of preparation.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
53	Assessments must be fair to children in terms what was taught.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
54	Tests provide information out of context.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
55	Assessments are not connected to students' real ability, just their test taking ability.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
56	Assessment results must be used carefully.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
57	Assessments are too reliant on reading skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
58	Assessments are too reliant on writing skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
59	Observational tools are better than tests.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
60	Assessment is not connected to real learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
61	Assessments are not necessarily aligned to teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
62	Assessments are not necessarily aligned to curriculum.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
63	Assessments have negative consequences on teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
64	Assessment results are filed and ignored.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
65	Assessments are not needed to guide teaching; curriculum	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

	and experience are enough.												
66	Assessments measure higher order thinking skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
67	Assessments measure lower order skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
68	Assessments can increase student motivation.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
69	Assessments can decrease student motivation.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
70	Assessments must be child-centered.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
71	Assessments should not be too difficult for the student.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
72	Assessments must be student friendly.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
73	Assessments engage student interest.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
74	Assessments are individual activities, not group or pair work.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
75	Teacher support is good in assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

Part II: Teacher Instructional Practice

Directions: This questionnaire assesses your instructional practice. There are no right or wrong responses. Use the rating scale below to select the option that best reflects how much you agree with the statement by placing a tick in the box below the appropriate option to the right of each statement.

Statement		**Response**											
1	I continually (on all assignments and during class) provide feedback on student work.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
2	Substantial learning occurs for all students regardless of their aptitude.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
3	As a teacher I am	Strongly	1	2	3	4	5	6	7	8	9	10	Strongly

	responsible for what students learn.	Agree	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Disagree
4	My students know how well they are doing in my class.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
5	I articulate, in advance of teaching, what I expect my students to know and be able to do at the end of a lesson.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
6	I make up my own assessments based on clearly articulated objectives and goals.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
7	My assessment method is usually closed-ended exams, quizzes or other assignments (e.g., multiple choice, matching, true-false items).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
8	My assessment method is usually open-ended exams or quizzes or other assignments (e.g. short answers or essay items).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
9	My assessment method is usually written assignments (e.g. essays, reports, journals).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
10	My assessment method is usually portfolio assessment (e.g. a collection of assignments, work samples).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
11	My assessment method is usually observations (e.g., evaluating participation, group work).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

12	My assessment method is usually performance task (e.g., assessment of students as they work on a problem or task).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
13	I frequently (on 80% or more of all assignments, as well as during class) assess students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
14	I regularly (more than 50% of the time) use assessments that I prepare to test my students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
15	I engage in professional learning with other teachers to examine student work and analyze evidence regarding student learning and instruction.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
16	I regularly (whenever I find that more than 25% of my students do not understand what I am teaching) improve lesson plans and reflect on the effectiveness of my lessons.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
17	I encourage other teachers to observe my teaching as a way to improve my instruction.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
18	I regularly (more than 50% of the time) use exemplars as models so that students are able to see and ask questions about the criteria by which their work will be graded.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

19	Assessments are developed based on what I expect students to know and be able to do.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
20	I consistently use classroom assessment information to revise and guide teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
21	I consistently use classroom assessment information to guide learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
22	My feedback to students is frequent, (on 80% of all work handed in as well as on classroom dialogue).	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
23	My feedback to students is immediate (within 2days), helping them to know how to improve.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
24	Most of my students are actively involved in their assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
25	Most of my students are effectively involved in their assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
26	My students consistently, communicate with others (teachers, peers, and parents) about their achievement status and improvement.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
27	I use data to make decisions about my instructional practice.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
28	I use observation to make decisions about my instructional practice.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
29	I use portfolios to	Strongly	1	2	3	4	5	6	7	8	9	10	Strongly

	make decisions about my instructional practice.	Agree	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Disagree

Part III: Use of Assessment Data

Directions: This questionnaire assesses your use of assessment data. There are no right or wrong responses. Use the rating scale below to select the option that best reflects how much you agree with the statement and by placing a tick in the box below the appropriate option to the right of each statement.

Statement		**Response**											
1	I use assessment to determine what students know and are able to do.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
2	I use assessment to improve instruction.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
3	I adjust my teaching based on data I access about students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
4	I use assessment to identify and correct gaps in the curriculum for all students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
5	I use assessment to adjust instruction to individual students' needs	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
6	I use assessment to let my students know how well they are doing in my classroom.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
7	I articulate, in advance of teaching, what I expect my students to know and be able to do at the end of a lesson.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
8	I use assessment to increase student motivation	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
9	I use assessment to clearly articulated achievement targets.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
10	I use assessment to include students in their own learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
11	I frequently (on 80% or	Strongly	1	2	3	4	5	6	7	8	9	10	Strongly

	more of all assignments, as well as during class) use assessment information to guide my teaching.	Agree	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Disagree
12	I use assessment to monitor my instructional strategies to target understanding for all of my students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
13	I use assessment to modify my instructional strategies to target understanding for all of my students.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
14	I use assessment to give students specific feedback about their learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
15	I use assessment to acknowledge students significant achievements.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

Demographic Information:

37. What is your gender? _____Male _____Female

38. What is your age? _____

39. How many years have you been a teacher?_____

41. What Class(s) do you teach? _____ grade(s)

42. What is your highest degree earned? _____

43. What subject(s) do you teach? _____

45. School management? _____

Thank you for completing the survey! Please return to Candy Armstrong

Appendix C

Institutional Review Board Approval

Oklahoma State University Institutional Review Board

Date:	Monday, February 07, 2011
IRB Application No	AG115
Proposal Title:	Belizean Primary School Teachers Use of Student Assessment Data
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 2/6/2012

Principal Investigator(s):

Candy Jones Armstrong	Kathleen Kelsey
Beliz	466 Ag Hall
Stillwater, OK 74078	Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Shelia M. Kennison

Shelia Kennison, Chair
Institutional Review Board

APPENDIX D

Teacher's Letter of Informed Consent

February 24, 2011

Dear Teacher,

I am conducting a study that involves your perceptions of student assessment and the role of assessment in education. The purpose of this study is to examine whether training level of primary school teachers significantly impacts their understanding of assessment, their assessment practices and their use of assessment data. I am completing this study in partial fulfillment of the requirements for a doctorate in Higher Education through Oklahoma State University.

I am asking you to complete the attached survey if you agree to participate. The questionnaire is divided into five parts. The introduction, Part I of the survey, will gather information of your conceptions of assessment, Part II will include a series of statements to examine your assessment practices and Part III of the survey instrument includes statements of how you use the data you collect from assessment. The last part of the survey instrument solicits demographic information to determine characteristics of such as your gender, age, ethnicity, level of training, teaching experience, and denominational management.

It will take you about 25 minutes to complete the survey. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time, without penalty.

There are no risks associated with this survey, including stress, psychological, social, physical, or legal risk which are greater, considering probability and magnitude, than those ordinarily encountered in daily life. If, however, you begin to experience discomfort or stress in this project, you may end your participation at any time.

Your participation many contribute to your knowledge of assessment, assessment practices and use of assessment data.

I am not collecting any identifying information so your responses cannot be connected with you. All information collected will be kept confidential. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to the records. Results from this study may be presented at professional meetings or in publications. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research.

You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study: Kathleen Kelsey , Ph.D., Agricultural Hall, Oklahoma State University, Stillwater, OK 74078, (405) 744-8137. If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

Sincerely,

Candy Armstrong
Barrier Reef Drive
San Pedro Town, Belize, Phone: 668-9350

Appendix E

Reverse Scored Items

Part I: Understanding of Assessment

Directions: This questionnaire assesses your understanding of assessment. There are no right or wrong responses. Use the rating scale below to select the option that best reflects how much you agree with the statement by placing a tick in the box below the appropriate option to the right of each statement.

Statement		**Response**											
34	Assessment is unbiased.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
53	Tests provide information out of context.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
54	Assessments are not connected to students' real ability, just their test taking ability.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
56	Assessments are too reliant on reading skills.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
59	Assessment is not connected to real learning.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
60	Assessments are not necessarily aligned to teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
61	Assessments are not necessarily aligned to curriculum.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
62	Assessments have negative consequences on teaching.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
63	Assessment results are filed and ignored.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
64	Assessments are not needed to guide teaching; curriculum and experience are enough.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
73	Assessments engage student interest.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree
74	Assessments are individual activities,	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

	not group or pair work.												
75	Teacher support is good in assessment.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

Part II: Teacher Instructional Practice

Directions: This questionnaire assesses your instructional practice. There are no right or wrong responses. Use the rating scale below to select the option that best reflects how much you agree with the statement by placing a tick in the box below the appropriate option to the right of each statement.

Statement		**Response**											
2	Substantial learning occurs for all students regardless of their aptitude.	Strongly Agree	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Strongly Disagree

APPENDIX F

Belizean Primary School Teachers Level of Training

District	QUALIFICATION														TOTAL	% Trained	% Fully Trained
	TRAINED								BA/BSc	Associate Degree	First Class	High School	Second Class	Other / not stated			
	MEd	BEd	Cert. Edu	LCP	ACP	Asc PEd	L2/2+1	Level 1									
Urban	31	138	37	16	27	93	216	49	49	397	85	187	2	18	1,345	45.1	41.5
Belize	19	63	15	9	13	35	91	13	26	218	45	91	1	11	650	39.7	37.7
Cayo	6	28	9	3	1	24	41	15	11	71	26	67	1	4	307	41.4	36.5
Corozal	0	5	3	0	4	8	34	2	1	22	3	2	0	0	84	66.7	64.3
Orange Walk	3	29	5	1	2	13	24	6	4	47	3	6	0	0	143	58.0	53.8
Stann Creek	1	7	5	2	5	7	15	10	2	30	4	13	0	2	103	50.5	40.8
Toledo	2	6	0	1	2	6	11	3	5	9	4	8	0	1	58	53.4	48.3
Rural	25	113	43	8	18	121	248	71	25	420	186	279	3	43	1,603	40.4	35.9
Belize	4	7	3	0	3	17	32	6	4	44	21	37	0	6	184	39.1	35.9
Cayo	5	30	5	2	1	22	54	16	8	86	58	76	1	26	390	34.6	30.5
Corozal	7	30	12	1	1	37	64	11	5	49	17	17	1	1	253	64.4	60.1
Orange Walk	8	31	9	4	6	14	46	12	7	84	8	15	0	1	245	53.1	48.2
Stann Creek	0	9	7	1	7	20	28	8	1	129	22	46	0	2	280	28.6	25.7
Toledo	1	6	7	0	0	11	24	18	0	28	60	88	1	7	251	26.7	19.5
Total	56	251	80	24	45	214	464	120	74	817	271	466	5	61	2,948	42.5	38.5
Belize	23	70	18	9	16	52	123	19	30	262	66	128	1	17	834	39.6	37.3
Cayo	11	58	14	5	2	46	95	31	19	157	84	143	2	30	697	37.6	33.1
Corozal	7	35	15	1	5	45	98	13	6	71	20	19	1	1	337	65.0	61.1
Orange Walk	11	60	14	5	8	27	70	18	11	131	11	21	0	1	388	54.9	50.3
Stann Creek	1	16	12	3	12	27	43	18	3	159	26	59	0	4	383	34.5	29.8
Toledo	3	12	7	1	2	17	35	21	5	37	64	96	1	8	309	31.7	24.9

Source: Ministry of Education Abstract of Statistics (2008-2009)

VITA

Candy Jones Armstrong

Candidate for the Degree of

Doctor of Education

Thesis: BELIZEAN PRIMARY SCHOOL TEACHERS'UNDERSTANDING OF ASSESSMENT, ASSESSMENT PRACTICES AND USE OF STUDENT ASSESSMENT DATA

Major Field: Higher Education

Biographical: Born on April 15, 1972 to Glenford Jones and Shirley Rhaburn. The elder of two siblings.

Education:

Completed the requirements for the Doctor of Education in Higher Education at Oklahoma State University, Stillwater, Oklahoma in August, 2011.

Completed the requirements for the Master of Science in Educational Leadership at University of North Florida, Jacksonville, Florida in 2005.

Completed the requirements for the Bachelor of Science in primary education at University of Belize, Belize in 2003.

Experience:

Education Officer, Belize Ministry of Education September 2009-Present
Literacy Coordinator, Caribbean Center for Excellence in Teacher Training, Belize September 2008 - August 2009
Teacher St. Ignatius School, Belize City September 2002 - August 2008
Vice Principal Guadalupe RC School September 1999 - August 2002
Teacher Our Lady of the Way RC school, September 1992 - August 1999

Professional Memberships: Belize National Teachers' Union, National Trade Union Congress of Belize, Youth Enhancement Services

Name: Candy Jones Armstrong Date of Degree: December, 2011*

Name: Candy Jones Armstrong Date of Degree: December, 2011

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: BELIZEAN PRIMARY SCHOOL TEACHERS' UNDERSTANDING OF ASSESSMENT, PRACTICES FOR ASSESSING STUDENTS' LEARNING AND USE OF STUDENT ASSESSMENT DATA TO GUIDE TEACHING

Pages in Study: 122 Candidate for the Degree of Doctor of Education

Major Field: Higher Education

Scope and Method of Study: This quantitative survey study examined teachers' understanding of assessment, their practices in assessing student learning and their use of assessment data to guide their teaching. Specifically, this study sought to determine if level of training had an impact on teachers' understanding of assessment, teachers' practices in assessing student learning, or teachers' use of assessment data to guide their teaching. The overarching research focus was to find out whether teachers with more training had a greater and more positive understanding of assessment, whether they assessed their students more frequently and appropriately and whether they reported more frequent use of assessment data in guiding their teaching than those teachers with less training

Findings and Conclusions: The results of this study showed a significant difference in understanding between teachers who had an associate's degree in primary education and teachers who had no training. Data driven decision making provided the framework to explain the teachers' assessment practices and use of student assessment data. Among the key finding of this study was that differences were not found in teachers' practices for assessing students' learning nor use of assessment data to guide teaching regardless of the teachers' level of training, gender, age or teaching experience. The mean understanding score for the entire group fell in the range of good understanding of assessment. The group with an associate's degree reported the highest mean score for all three areas (understanding, practice and use) compared with all the other groups. The highest qualified groups who had master's degrees in education or bachelor's degrees in primary education, had the highest mean scores for all three areas (understanding, practice and use) indicating that they had the least understanding of assessment, had the least positive assessment practices, and the least effective use of assessment data.

Recommendations: It is recommended that an associate's degree in primary education be the minimum requirement for entry in the teaching profession. Professional development sessions should be conducted for teaching staff to enhance their assessment skills and their knowledge of assessment, and for enhancing their assessment practices and use of data to guide their teaching. Students should be involved in the formative assessment process as their input is critical for increasing academic achievement.

ADVISER'S APROVAL: _____

Dr. Edward Harris