

THE EFFECTS OF BACKGROUND, CLASSROOM ASSESSMENT COMPETENCE, SELF-  
EFFICACY, AND SELF-PERCEIVED ASSESSMENT SKILLS ON CLASSROOM  
ASSESSMENT PRACTICES OF TEACHERS IN INDIA

By

Manognya Murukutla

Bachelor of Science – Business Administration  
State University of New York at Buffalo  
2008

Master of Hospitality Administration  
University of Nevada, Las Vegas  
2010

A dissertation submitted in partial fulfillment  
of the requirements for the

Doctor of Philosophy - Educational Psychology

Department of Educational Psychology and Higher Education  
College of Education  
The Graduate College

University of Nevada, Las Vegas

December 2019

ProQuest Number:27671130

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent on the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 27671130

Published by ProQuest LLC (2020). Copyright of the Dissertation is held by the Author.

All Rights Reserved.

This work is protected against unauthorized copying under Title 17, United States Code  
Microform Edition © ProQuest LLC.

ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106 - 1346

This dissertation prepared by

Manognya Murukutla

entitled

The Effects of Background, Classroom Assessment Competence, Self-Efficacy, and Self-Perceived Assessment Skills on Classroom Assessment Practices of Teachers in India

is approved in partial fulfillment of the requirements for the degree of

Doctor of Philosophy - Educational Psychology  
Department of Educational Psychology and Higher Education

Alice Corkill, Ph.D.  
*Examination Committee Chair*

Kathryn Hausbeck Korgan, Ph.D.  
*Graduate College Dean*

CarolAnne Kardash, Ph.D.  
*Examination Committee Member*

Lisa Bendixen, Ph.D.  
*Examination Committee Member*

David Copeland, Ph.D.  
*Graduate College Faculty Representative*

## Abstract

Teacher-conducted assessments are necessary to gather important information to facilitate student learning and academic success. Unfortunately, there is an inconsistency in teacher knowledge of assessment and assessment practices. While previous research identified a gap in teacher competence and teacher perceptions of their competence, and this affects classroom assessment practices that then impact student learning, the research is limited, outdated, and not grounded in any theoretical framework. This study addresses gaps in literature and establishes self-efficacy as a theoretical framework in which classroom assessment can be studied. Data were collected in India, and a path analysis and a Kruskal Wallis non-parametric analysis were conducted to examine the relationships between teacher competence, perceptions of their assessment skills, self-efficacy and classroom assessment practices, as well as the effects that they have on each other. Self-efficacy was not as prominent in explaining the relationships between classroom assessment practices, teacher assessment competence, teacher perceptions of assessment skills and teacher background as had been hypothesized, reinforcing the domain specific nature of self-efficacy. Nonetheless, competence, self-efficacy, perception of assessment skills, and classroom assessment practices were found to differ based on years of experience and content area taught.

## Acknowledgements

This undertaking would not have been possible without the support of my dissertation committee. Dr. Corkill, Dr. Kardash, Dr. Bendixen, and Dr. Copeland, thank you for your insightful comments, encouragement, enduring patience and guidance in this endeavor. I truly owe my success as a doctoral student to you all. I am especially indebted to Dr. Alice Corkill, my committee chair and advisor extraordinaire. I cannot thank you enough for your faith in me, for believing in me when I didn't, and for never letting me give up. I hit the jackpot with you and am eternally grateful.

To my supervisors, Dr. Lindsay Couzens, Dr. Margarita Huerta, and Dr. Laura Yavitz: your extensive personal and professional guidance has taught me a great deal. You have been supportive of my personal, academic, and career goals and allowed me the time and flexibility to pursue those goals. For this, I cannot appreciate you enough.

Dr. Tiberio Garza and Dr. Cheryl Vanier, thank you for answering my never-ending statistics questions. Completion of this project would have been impossible without your help.

To my friends: Rachel, Shar, Celeste, Sarah, Christie, Rohit, Babita, and Bala, my support system, you've seen me at my best and my worst. I couldn't have asked for a better group of people to have in my life.

Nobody has been more important to me in the pursuit of this project than the members of my family. I would like to thank my parents, whose love, support, and guidance are with me in whatever I pursue. I will never be able to give you sufficient thanks for everything you've done for me. I love you. To my sister, thank you for the constant encouragement and moral support. To my husband, this dissertation is really yours. Thank you for walking with me every step of the way, through ups and downs and sleepless nights, this success is yours as much as it is mine.

Last but not least, to my children, you have helped me more than you will ever know. I love you so much!

This dissertation is dedicated to Dr.CarolAnne Kardash, whose passion for research is a constant source of inspiration.

## Table of Contents

Abstract.....	iii
Acknowledgements .....	iv
List of Tables .....	x
List of Figures.....	xi
Chapter 1 .....	1
Introduction.....	1
Background .....	2
Classroom Assessment in Asia .....	4
Problem and Significance.....	6
Purpose of the study.....	6
Research Questions.....	8
Research Design and Procedures .....	8
Correlational Design. ....	8
Instrument Adaptation.....	9
Procedure.....	9
Organization of the Study .....	9
Chapter 2 .....	11
Literature Review .....	11
Assessment for Learning .....	12
Development of Student Assessment.....	13
Teachers' Role in Student Learning and Classroom Assessment .....	14
Gap in Teacher Knowledge of Classroom Assessment.....	16
Teachers' Assessment Perceptions .....	24
Summary of Instruments Based on the 1990 Standards .....	29
Asian Classroom Assessment Practices .....	31
Classroom Assessment in the Indian Context .....	35
Self – Efficacy .....	37
Teacher Self-Efficacy.....	38
Self-concept of ability. ....	41
Current Study.....	43
Research Questions.....	43
Summary.....	44
Chapter 3 .....	46



<b>Methodology .....</b>	<b>46</b>
<b>Problem and Significance.....</b>	<b>46</b>
<b>Purpose of the study.....</b>	<b>47</b>
<b>Research Design .....</b>	<b>48</b>
<b>Sample .....</b>	<b>48</b>
<b>Data Collection Procedures.....</b>	<b>49</b>
<b>Instrument. ....</b>	<b>49</b>
<b>Instrument Adaptation .....</b>	<b>49</b>
<b>Procedure.....</b>	<b>50</b>
<b>Research Questions.....</b>	<b>50</b>
<b>Variables .....</b>	<b>51</b>
<b>Validity and Reliability.....</b>	<b>51</b>
<b>Chapter 4 .....</b>	<b>56</b>
<b>Results .....</b>	<b>56</b>
<b>Descriptive Statistics.....</b>	<b>56</b>
<b>Frequencies and Percentages .....</b>	<b>57</b>
<b>Summary Statistics .....</b>	<b>57</b>
<b>Normality .....</b>	<b>58</b>
<b>Homogeneity of Variance .....</b>	<b>59</b>
<b>Homoscedasticity.....</b>	<b>59</b>
<b>Multicollinearity.....</b>	<b>60</b>
<b>Model fit.....</b>	<b>62</b>
<b>Interpretations for regressions .....</b>	<b>62</b>
<b>Mediation .....</b>	<b>64</b>
<b>Kruskal-Wallis .....</b>	<b>65</b>
<b>Chapter 5 .....</b>	<b>70</b>
<b>Discussion and Implications.....</b>	<b>70</b>
<b>Summary of Results.....</b>	<b>70</b>
<b>Self-efficacy.....</b>	<b>70</b>
<b>Perception of skills .....</b>	<b>71</b>
<b>Content Area. ....</b>	<b>72</b>
<b>Years of experience.....</b>	<b>73</b>
<b>Scientific and scholarly significance.....</b>	<b>74</b>
<b>Limitations and Further Research .....</b>	<b>75</b>

<b>Appendix A</b> .....	<b>77</b>
<b>Appendix B</b> .....	<b>79</b>
<b>Appendix C</b> .....	<b>91</b>
<b>Appendix D</b> .....	<b>95</b>
<b>References</b> .....	<b>96</b>
<b>Curriculum Vitae</b> .....	<b>102</b>

## List of Tables

Table 1. <i>Variables</i> .....	51
Table 2. <i>Reliabilities</i> .....	52
Table 3. <i>Frequency Table for Nominal Variables</i> .....	57
Table 4. <i>Summary Statistics Table for Interval and Ratio Variables</i> .....	58
Table 5. <i>Shapiro-Wilk Test Results</i> .....	58
Table 6. <i>Variance Inflation Factors for Experience, Content, Length, Perception, Self-Efficacy, and Competence</i> .....	61
Table 7. <i>Fit Indices</i> .....	62
Table 8. <i>Mean Ranks</i> .....	68

## List of Figures

Figure 1. <i>Hypothesized Path Model</i> .....	54
Figure 2. <i>Residuals scatterplot testing homoscedasticity.</i> .....	60
Figure 3. <i>Path Model with <math>\beta</math> Values</i> .....	63
Figure 4. <i>Mediation Models</i> .....	65
Figure 5. <i>Mean Ranks</i> .....	67

## Chapter 1

### Introduction

The main role of education is to facilitate learning. While instruction is key to the process of encouraging learning, it is incomplete and ineffective as a stand-alone function. To ensure that learning takes place, proper assessment is as critical as instruction. Assessment is necessary to fostering higher level learning in the classroom and beyond (Earl, 2013). Teacher-conducted assessments are necessary to gather important information required in making decisions about students' learning and progress. This information is crucial to the student learning process because it assists teachers in making judgments about academic performance and behavior, identifying student strengths and deficiencies, and making the necessary adjustments within the classroom or referring students for outside assistance.

This chapter provides an introduction and overview of this study. There is a gap in the classroom assessment literature in teacher knowledge of assessment and assessment practices. Classroom assessment plays a critical role in student learning and academic achievement. This necessitates an inquiry into and a compound analysis of the impact of teacher background, assessment competence, and teacher perception of assessment skills on classroom practices. This study provides an overview of the importance of classroom assessment for learning and of the development of student assessment in schools in India. Gaps in teacher knowledge of classroom assessment can be damaging to student academic achievement. While previous research (Impara, Divine, Bruce, Liverman & Gay, 1991; Zhang & Burry-Stock, 2003; Waldrip, Fishers & Doman, 2009) identified a gap in teacher competence and teacher perceptions of their competence and indicated that this affects classroom assessment practices that then impact student learning, the research is limited. Furthermore, factors that influence teacher assessment

competence and perception of skills, such as teacher demographics and background, are not explored in a compound manner. This is necessary to understand the relationships between the variables, and the influence that they have on each other. In addition, the relationships between cultural context and teacher assessment competence, perception of skills, and teacher assessment practices was not considered in previous studies. The goal of this study is to take a more holistic approach to understanding classroom assessment, while also exploring the above-mentioned variables in a different cultural context.

The purpose of this study was to understand the relationships between teacher background (i.e. content area, and years of teaching experience) classroom assessment competence, practices, self-efficacy, and self-perceived assessment skills of teachers in India. Specifically, the goals of this quantitative study were to understand:

- 1) The relationships between teacher background, teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in India.
- 2) The relationships between teacher background on classroom assessment practices in India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills.
- 3) The differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background

## **Background**

It is critical that teachers know how to conduct appropriate, high-quality assessments (Stiggins & Conklin, 1992). In the 1800s, the state of Massachusetts implemented written examinations in an attempt to hold public schools accountable for student outcomes (Resnick,

1982). Since then, other states in the USA have started addressing academic achievement of K-12 students (Marzano, 2006). Testing instruments have become the norm in assessing students' learning and communicating key content, skills, learning outcomes and performance results to students and parents. However, educators' stance assessment best practices and the utility of grades to communicate progress and achievement is inconsistent (Haldane, Downing, & Rodriguez, 2002). There is a varied amount of support for different forms of assessments. Traditional assessments consist of objective tests, e.g. multiple choice tests. These are preferred forms of assessment because of their efficiency and practicality in measuring knowledge standards and targets. Alternative assessment methods include portfolios, journal critiques, and research essays (McMillan, 2008). Different types of assessments address different types of functions. Regardless of the methods used, teachers must understand the assessment methods that exist, the functions they serve, and the types of learning they measure. Unfortunately, this does not appear to be the case.

To understand and quantify teacher ability in classroom assessment, it is necessary to focus on teachers' understanding of assessment and measurement, and their competency in discriminating between good and ineffective assessment practices (Stiggins & Conklin, 1992). Standards for Teacher Competence in the Educational Assessment of Students were developed in order to measure teacher literacy in the domain of classroom assessment. Researchers have used the standards to quantify individual teacher assessment literacy.

Assessment is a complex process and teachers' classroom assessment practices have been found to be problematic. Of prime concern is teachers' lack of sufficient knowledge of basic testing and measurement concepts (Stiggins & Chappuis, 2005), limited teacher training in

assessment (Plake, Impara, & Fager, 1993), and the failure of teachers to implement proper assessment practices they were taught in measurement courses (Campbell & Evans, 2000).

Panizzon and Pegg (2007) underscore the impact that teachers have on assessment and learning in the classroom and the importance of teachers' competence in, and knowledge of, classroom assessment. This is because teachers need to use assessment information to make informed decisions about students' learning and communicate assessment results effectively. Therefore, teacher competency and knowledge regarding classroom assessment is directly related to effective student learning (Zhang & Burry-Stock, 2003). Unfortunately, teachers lack adequate knowledge and competence regarding classroom assessment procedures and fail to follow to approved assessment practices (Campbell & Evans, 2000; Daniel & King, 1998; Plake, Impara & Fager, 1993; Frey & Schmitt, 2007). In spite of those issues, teachers believe that they are sufficiently qualified in classroom assessment (Gullikson, 1984). Furthermore, Barksdale-Ladd and Thomas (2000) found that teachers were under intense stress due to the mandated standards and high-stakes testing. This resulted in undermining meaningful instruction and teachers holding negative perceptions toward assessments.

Unfortunately, there is limited empirical research on perceptions of teachers on classroom assessment and their own skills and competencies related to classroom assessment. This gap suggests a need to explore the relationships between teachers' perceptions and classroom assessment skills, knowledge and practices.

**Classroom Assessment in Asia.** Students from East Asian countries have been found to consistently outperform their other countries in the world in science, mathematics, and reading in the Program for International Student Assessment (PISA), a survey conducted by the Organization for Economic Cooperation and Development (OECD) to test education systems by



comparing the test performance of 15-year-old students. A review of classroom assessment practices in East Asian Countries, though limited, revealed varying practices in teacher competence and perceptions. Nonetheless, there was agreement that the purpose of assessment is to facilitate learning and performance, with teachers' use of assessment affecting student performance and quality of work (Koh & Luke, 2009) and teacher competence being irrelevant to teachers' perceptions of their skills in classroom assessment (Alkharusi, Aldhafri, Alnabhani & Alkalbani, 2012). However, the results are difficult to generalize, given the differences between the countries that were examined in each study.

One Asian country that is not presently represented in classroom assessment research is India. There is no published research on classroom assessment practices in India, nor is there an indication of whether teachers are trained in assessment. There are no published standards for assessment or measurement competency. All that is known of assessment and evaluation of student aptitude in India is that, like in other countries in East-Asia, it is exam based and highly competitive in nature (Kapur, 2008; Venkatachalam, 2017). However, due to its size, population, and role as an economic power in Asia, India may provide worthwhile insight to classroom assessment practices and provide actionable suggestions to further assessment research (Venkatachalam, 2017).

India is a vastly diverse country with a considerable amount of regional, linguistic, cultural, and religious diversity across the country. This makes India interesting to study. Furthermore, the curriculum for the entire country is the same, set by the government of India. Private schools and public schools all teach a common curriculum to their students, and all students across take the same standardized tests. From a research perspective, India is valuable because it is a large diverse country with a common curriculum (Chhokar, 2013).

## **Problem and Significance**

The emphasis on high-stakes testing in the US resulted in teachers focusing on “teaching to the test”. Teachers prioritized mimicking high-stake exam formats rather than focusing on levels of student learning (Nichols & Berliner, 2007). This tendency is also evidenced in India, where students are taught to the test and are unable to apply knowledge to real world contexts (Venkatachalam, 2017). To date, policy-makers, school officials, and teachers in India remain uninformed of classroom assessment practices and their effects on students’ learning in India. The NCSE evaluation states that teachers are not sufficiently trained because teacher educators are ill-equipped to train teachers (Confederation of Indian Industry, 2013). Classroom assessment was not discussed, but it was recommended that teacher educator training be reformed in order to ensure teacher educators are better qualified to train pre-service teachers. It is assumed that this will fix the problem of unqualified teachers, which will then solve the problem of low quality education in India. Nonetheless, it is uncertain how teachers’ qualifications can be improved, specifically, what their competence in classroom assessment is and how it affects their classroom assessment practices. While that might be only part of a concern of the government of India, given the importance of classroom assessment, it is worth investigating teachers’ competence and perceptions of their classroom assessment skills, and how this affects classroom assessment practices in India.

## **Purpose of the study**

The purpose of this study is to understand assessment competence, practices, and self-perceived assessment skills of teachers in India. This study attempted to understand the relationships between teacher background (i.e. content area, and years of teaching experience)

classroom assessment competence, practices, self-efficacy, and self-perceived assessment skills of teachers in India. Specifically, the goals of this quantitative study were to understand:

- 1) The relationships between teacher background, teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in India.
- 2) The relationships between teacher background on classroom assessment practices in India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills.
- 3) The differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background

The assessment practices implemented in the classroom have an effect on their students' performance. According to Stiggins (1991), teachers spend a large portion of their class time engaging in assessment related activities. As a result, teachers need to be well informed about assessment and measurement. However, that is not always the case. Given the impact on student achievement, teachers' competency levels in assessment and their perceived skills in classroom assessment, and how these affect classroom assessment practices, are important to study.

Furthermore, the assessment choices teachers make within their classroom and whether teacher demographics and background affect these choices are also worth studying. The classroom assessment situation in India is uncertain, because much is unknown and left to presuppositions. This makes it all the more important and interesting to investigate, given the role of India as an economic entity in the world.

## Research Questions

The following research questions were addressed in this study:

- 1) What are the relationships between teacher background (i.e. content area, and years of teaching experience), teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in India?
- 2) What are the relationships between teacher background (i.e. content area, and years of teaching experience) on classroom assessment practices in India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills?
- 3) What are the differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background (i.e. content area, and years of teaching experience)?

## Research Design and Procedures

**Correlational Design.** The proposed study will use a correlational design. This quantitative study used a survey instrument to collect data to answer the proposed research questions. A cross-sectional survey was used to collect data from the selected sample at a single point in time. This was a single, stand-alone study. This design was selected because the purpose of this study is to provide an understanding of the behaviors, attitudes, and knowledge of the selected sample in relation to classroom assessment. Furthermore, the goal of this study is exploratory and to inform future research, but not to understand development over time (Gay, Mills & Airasian, 2012). Quantifiable information was collected from all members of the sample through a structured questionnaire. In order to collect standardized data that is comparable from all the participants, the same instrument was distributed to the entire population at the same time through an online survey website.

**Instrument Adaptation.** The original questionnaires by Plake et al. (1993), Zhang and Burry-Stock (1994) and Schwarzer, Schmitz, & Daytner, (1999) were shared with a high school principal in India who is an expert in classroom assessment and the Indian education system via email. The questionnaires were reviewed, and suggestions were made to revise the instrument to make it more appropriate to the Indian context.

**Procedure.** The questionnaire was uploaded onto the online survey software, Qualtrics, and the survey link was shared with high school principals in two states in the South-Central region of India to distribute to all teachers in their schools. Teachers were also encouraged to share the survey with other teachers whom they thought would be interested in participating in the study.

### **Organization of the Study**

This document is divided into five chapters. Chapter 1 provides a summarized overview of the study, including a brief review of relevant literature, the problem statement and purpose of this study, the research questions and method and design of the study. Chapter 2 reviews relevant literature in greater detail, as well as the theoretical framework used for this study. The literature review is divided into three groups: studies conducted in the USA, studies conducted in Asia, and a brief overview of literature on Self-Efficacy, the theoretical framework used for this study. Studies in each group are presented in a chronological order. Finally, the educational context in India (where the sample for the present study will be collected) is presented and described. The existing problem is then identified, and the proposed research questions are listed. The chapter is then wrapped up with a brief summary. Chapter 3 presents the methodological overview for the present study. The research design, sampling technique and procedures are discussed. The research questions are revisited, and the proposed analysis is explored. Chapter 4 describes the

findings of the study. Chapter 5 presents a discussion of the results, the significance of the findings, and implications for practice and further research.

## Chapter 2

### Literature Review

This review of the literature highlights a gap in assessment research. It provides context for the need for examination of the relationships between teacher background, assessment competence, and teacher perception of assessment skills on classroom practices. This review provides a brief overview of the importance of classroom assessment for learning and of the development of student assessment in schools in the USA. This review of the literature then discusses teachers' role in classroom assessment and student learning. Gaps in teacher knowledge of classroom assessment are outlined and discussed in two parts: 1) teacher competence and 2) teacher perceptions of their competence. The limited previous research that has been conducted on classroom assessment is examined in a chronological order. Factors that influence teacher assessment competence and perception of skills, such as teacher demographics and background, are explored. In order to understand the impact of cultural context on teacher assessment competence, perception of skills, and teacher assessment practices, studies conducted in Asia are also discussed. Finally, the contextual framework for this research, the education system in India, is described and connected to the gap in literature on classroom assessment. Questions that this study proposes to answer are then presented.

The purpose of this study was to understand the relationships between teacher background (i.e. content area, and years of teaching experience) classroom assessment competence, practices, self-efficacy, and self-perceived assessment skills of teachers in India. Specifically, the goals of this quantitative study were to understand:

- 1) The relationships between teacher background, teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in India.

- 2) The relationships between teacher background on classroom assessment practices in India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills.
- 3) The differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background

### **Assessment for Learning**

The field of education focuses on the facilitation of learning. While instruction is at the forefront of encouraging learning, it is incomplete and ineffective without proper assessment. Assessment is critical to fostering higher level learning in the classroom and beyond (Earl, 2013). Teachers conduct assessments to gather information and make decisions about students' learning and progress. The information gathered is necessary to make judgments about students' academic performance and behavior. It also allows teachers to diagnose student strengths and deficiencies. Teachers will then be able to make adjustments within the classroom to accommodate students' learning needs or refer students for outside assistance. Although different researchers have identified different numbers of purposes of assessment, there appears to be consistency on what the main purposes of assessment are. The primary purposes of assessment are 1) evaluating student progress and documenting students' strengths and weaknesses, 2) informing and improving curriculum and instruction, 3) holding teachers and schools accountable (Kane, Khattri, Reeve, & Adamson, 1997; Phye, 1997).

An understanding of the purposes and types of assessments, as well as student perceptions and learning outcomes, allows for the development and implementation of appropriate assessment practices that improve teaching and learning. In addition, as Stiggins and Conklin (1992, p. vii) state, "it is absolutely essential that educators not only understand the



nature of the outcomes students are to achieve, but also know how to translate those achievement targets into appropriate, high-quality assessments”. In the next section, teachers’ roles in classroom assessment and students’ learning will be discussed further.

### **Development of Student Assessment**

Academic achievement is of prime interest to educators around the world. In the 1800s, state of Massachusetts was the first state in the USA to consider using assessment to enhance academic achievement and hold public schools accountable for student outcomes (Marzano, 2006). Teachers use assessments to convey to students and parents key student learning outcomes and to communicate how well students are learning the material (Haladyna, Downing, & Rodriguez, 2002). Even so, there is no consensus among educators on the optimal methods of assessing these outcomes and the utility of grades to communicate progress and achievement. Some educators are in favor of using traditional, objective forms of assessments such as multiple-choice tests, because of their efficiency and practicality in measuring knowledge standards and targets, while others prefer alternative assessment methods, such as portfolios, journal critiques, and research essays, which measure skills necessary for academic achievement (McMillan, 2008).

Stiggins and Chappuis (2005) argued that in the past, schools used assessment results to rank students in terms of academic achievement. This process resulted in many students underachieving and feeling hopeless about their learning. Non-traditional assessment methods, known as alternative assessment methods, were developed to metacognition and self-regulation of learning (Elango, Jutti, & Lee, 2005). The need for classroom assessments that measured knowledge, skills and abilities that students used beyond that classroom resulted in a push for

change from traditional assessment methods (Reynolds, Livingston & Willson, 2009; Waldrip, Fishers, & Dorman, 2009).

### **Teachers' Role in Student Learning and Classroom Assessment**

In order to ensure effective teaching, teachers need to make effective teaching decisions. This requires teachers to discern their students' learning and cater instruction accordingly (McMillan, 2008). However, this is not easy. Assessment is a complex process and the stakes are high (Earl, 2013). Furthermore, teachers' use of classroom assessment can be problematic, due to: 1) teachers' lacking knowledge in basic testing and measurement (Stiggins & Chappuis, 2005), 2) limited teacher training in assessment (Plake, Impara, & Fager, 1993), and 3) failure of teachers to comply with what they learned in assessment courses (Campbell & Evans, 2000). Schools are being increasingly held accountable through policy mandated large-scale assessment, therefore policy directives make assessment practices more important, not only for students, but for administrators and teachers. Teachers, in particular, face increasing pressure due to their role in developing assessments and using them in their classrooms (Earl, 2013).

Teachers play a critical role in classroom assessment. Even when large-scale assessments, such as standardized tests, are the main indicators used to measure student progress and achievement, teachers implement assessment practices in classrooms on a regular basis to measure students' learning outcomes. A large portion of teachers' classroom time is spent in student assessment related activities such as issuing quizzes and homework to measure student learning. Teachers regulate classroom assessment environments by choosing the methods of assessments to implement, the frequency of these assessments, and the methods of delivering feedback to students. It is clear that classroom assessment is an important part of the learning and

instruction, and that classroom assessment practices are critical to enhancing education (Nenty, Adedoyin, Odili, & Major, 2007).

In a study of 25 teachers from six rural secondary schools in New South Wales, Australia, Panizzon and Pegg (2007) used the Structure of Observed Learning Outcome (SOLO), a cognitive structural model, to assess students' understandings and enhance student learning. Three workshops for the teachers, focusing on the SOLO model, were conducted. Student scripts coded by the teachers using the SOLO model and teacher interview transcripts were analyzed. All participants reflected a change in their assessment practices. Participants used a variety of questions to gauge students' understandings in their classrooms. The participants recognized that it was important to use a variety of styles of question in teaching and assessment allow students to demonstrate their conceptual understanding (Panizzon and Pegg, 2007). The participants of the study also saw a change in their perceptions of learning, which was reflected in their instructional and assessment practices. Students and other teachers also observed the difference in their practices (Panizzon & Pegg, 2007). This provides support for the impact that teachers have on assessment and learning in the classroom and for the importance of teachers' competence in, and knowledge of, classroom assessment.

In addition to implementing assessment tasks and collecting information, teachers must be competent enough to use assessment information to make informed decisions about students' learning. Therefore, understanding teachers' assessment competence and perceptions about assessment practices, assessment training, and their experiences in implementing multiple methods to assess students' learning is critical. It is also necessary to understand teachers' thought processes as they engage in instruction and assessment activities, such as grading and using assessment results to form judgements of students' learning. Zhang and Burry-Stock

(2003) state that teachers must be proficient in effectively communicating assessment results and that optimal communication of assessment results depends on teachers' competency in assessment, and knowledge of the limitations and strengths of different assessment methods. As a result, teacher competency and knowledge regarding classroom assessment is paramount to effective student learning.

### **Gap in Teacher Knowledge of Classroom Assessment**

Due to the importance of classroom assessment and the role of teachers in assessment practices, teachers must be competent in assessment. In addition to competency, McMillan (2003) states that teacher beliefs and perceptions of assessment affect their assessment practices and decisions regarding classroom assessment. Some teachers not only lack adequate knowledge and competence regarding classroom assessment procedures, but they also fail to implement recommended assessment practices (Campbell & Evans, 2000; Daniel & King, 1998). Unfortunately, more focus is placed on improving the use and quality of standardized examinations, while research on the quality of classroom assessments and training and professional development of teachers in classroom assessment practices have been neglected. Ohlsen (2007) states that policy is often in favor of using high-stakes tests to assess student and school performance, instead of encouraging classroom assessment. As a result, classroom assessment proficiency, despite being so important, is under-supported.

Student achievement is often the indicator used to evaluate and hold teachers and schools accountable (Miller, Linn & Gronlund, 2012). However, teachers are not trained enough to attain a level of competency in classroom assessment. In a national survey of teacher assessment competencies and perceptions, Plake, Impara, and Fager, (1993) found that, in general, teachers had a limited knowledge base in classroom assessment to implement effective assessments that

benefited students. Teachers lack of adequate knowledge in classroom assessment also resulted in teachers refraining from discussing appropriate assessment methods with a peer or superior. Teachers stated that this was a result of a lack of formal training in assessment. Frey and Schmitt (2007) expressed a similar concern, more than a decade later, indicating that little had changed. Araceli Ruiz-Primo and Furtak (2006) argue that even without the pressure and accountability on teachers to demonstrate student achievement, teacher competency in classroom assessment is still important due to the role of proper assessment practices in appropriately measuring students' performance and enhancing student learning.

Understanding that there is a gap is only the first step in addressing the issue. In order to offer a practical solution, classroom assessment perceptions, as well as competence and practices of teachers, need to be understood more fully. In the next section, the knowledge and skills that constitute assessment competence will be discussed.

### **Classroom Assessment Competence**

Barksdale-Ladd and Thomas (2000) interviewed 59 US teachers in an attempt to answer the following questions: 1) what perceptions do teachers hold about mandated standards and related tests and 2) how do teachers make instructional decisions given these mandates? They also interviewed 20 parents to gauge their perspectives on mandated standards and related tests. They found that both parents and teachers were under intense stress and that the mandated standards and related high-stakes tests undermined meaningful instruction. Even when implementing alternative assessments, it appears that teachers are no better off, because they hold negative perceptions toward these types of assessments.

For example, Kleinert, Kennedy, and Kearns (1999) studied teachers who were required to implement alternative assessments to students with moderate to severe disabilities. The study

examined teachers' perceptions of including their students in state and school accountability measures, as well as its instructional impact of alternative assessments on student outcomes. Teachers recognized the benefits of using alternative assessments in the classroom, perceived positive changes in instruction, and improved student outcomes, but they were frustrated with the use of alternative assessments. This was because alternative assessments took longer for students to complete, were more time consuming for teachers to grade, and require increased supervision. Teachers were also apprehensive in grading alternative assessments due to their limited knowledge (Kleinert et al., 1999).

Knowledge of teachers' ability to discriminate between good and poor assessment practices is needed to quantify teacher ability in terms of classroom assessment competence (Stiggins, 1991). Standards for teacher competence in the Educational Assessment of Students (hereafter referred to as Standards) were developed by the National Council on Measurement in Education (NCME), the American Federation of Teachers (AFT), and the National Education Association (NEA) (NCME, AFT, NEA, 1990). The standards related to teacher literacy in the domain of classroom assessment are as follows:

- 1) "Teachers should be skilled in choosing assessment methods appropriate for instructional decisions.
- 2) Teachers should be skilled in developing assessment methods appropriate for instructional decisions.
- 3) Teachers should be skilled in administering, scoring, and interpreting the results of both externally produced and teacher produced assessment methods.
- 4) Teachers should be skilled in using assessment results when making decisions about individual students, planning teaching, developing curriculum, and school improvement.

5) Teachers should be skilled in developing valid pupil grading procedures which use pupil assessments.

6) Teachers should be skilled in communicating assessment results to students, parents, other lay audiences, and other educators.

7) Teachers should be skilled in recognizing unethical, illegal, and otherwise inappropriate assessment methods and uses of assessment information.” (NCME, AFT, NEA, 1990.)

Researchers have used these seven standards to quantify individual teacher assessment literacy. Typically, multiple-choice questions that are geared to assess each of the standards have been developed to measure competence objectively (Mertler & Campbell, 2005; Plake, Impara, & Fager, 1993). Several researchers have determined that teachers are ill-prepared to engage in effective classroom assessment due to a lack of adequate training (Hills, 1991; O’Sullivan & Chalnick, 1991). Specifically, teachers’ knowledge was considered insufficient in performance assessment, interpretation of standardized test results, and grading procedures. In addition, many teachers failed to set performance and grading guidelines, define assessment procedures prior to instruction, and record assessment results (Stiggins & Chappuis, 2005). Appallingly, in preparation for standardized tests, teachers taught test items. During standardized testing, teachers gave students hints and extra time to complete tests, and even altered students’ answers (Hall & Kleine, 1992; Nolen et al., 1992). Teachers were also unable to understand standardized test scores (Hills, 1991; Impara et al., 1991), resulting in them being incapable of communicating and explaining test results to parents and students (Plake, 1993). Furthermore, teachers included factors unrelated to achievement (e.g. effort, attitude, and motivation) into grades (Griswold, 1993; Hills, 1991; Jongsma, 1991). Teachers also did not know how use weighted grading to

incorporate varying degrees of importance of different assessment components. Unfortunately, despite those issues, teachers believed that they were sufficiently qualified in classroom assessment (Gullikson, 1984). Studies confirming these statements are discussed below.

Plake, Impara, and Fager (1993) developed a 35-item questionnaire, with five multiple-choice questions per assessment standard. The maximum possible score was thirty-five, with one point per correct answer. The two-part study addressed the measure of assessment literacy and examined teacher perceptions and beliefs towards various aspects of general and classroom assessment. The second part of the study will be described in the teacher perceptions section below. The survey was administered to five hundred and fifty-five teachers in forty-five different states. Plake et al. (1995) found that teachers lacked assessment literacy and training, with teachers in the study scoring an average of 66%. In the second part of their study, Plake et al. (1993) examined teachers' perceptions of various aspects and practices of assessment. The second part of the study will be discussed below, in the "teachers' assessment perceptions" section of this study.

A survey of 143 Midwestern elementary and secondary school teachers who were enrolled in a master's program (Cizek, Fitzgerald, and Rachor, 1996) had findings similar to those of Plake et al. (1993). The purpose of the study was to determine frequency of use of assessment methods, types of marks used, and sources of assessments. Teachers' assessment practices were revealed to be inconsistent and highly variable. Characteristics such as gender, years of experience, and grade level influenced teachers' use of assessment practices in the classroom. Fifty-four percent of the teachers surveyed engaged in major objective assessment practices (such as giving assignments and tests) every two weeks. Seventy-five percent gave minor assignments weekly. Others gave tests and assignments less frequently. Seventy-four



percent developed their own assessments. On the average, 24 graded assessments were used when calculating final grades. Thirty-five percent of the teachers considered test difficulty when determining grades, 43% considered class performance, 51% considered individual student ability, and 42% considered individual student effort. Interestingly, although teachers reported limited training in classroom assessment, they admitted to developing their own assessments. Furthermore, teachers appeared to know little about their district's assessment policies.

Shulman (1980) found that most teachers only used results of assessment to assign grades. Stiggins and Conklin (1992) investigated this finding by studying a stratified sample of volunteer teachers from eight districts in different regions and types of communities throughout the United States. Twelve teachers from different content areas (English, math, and science) were selected from each of four grades (2, 5, 8, and 11). Two hundred and twenty-eight out of 334 surveys were returned and analyzed in conjunction with teacher's journals and observations. Forty-seven percent of teachers used teacher-made objective tests, thirty-nine percent of teachers used published tests, and fifty-seven percent used performance assessments. Teachers used these assessments for the purposes of diagnosing, grouping, grading, evaluating, and reporting student learning and performance information. Most frequently used were teacher made tests (32 - 48%), followed by performance assessments (29 - 34%). Published tests were used the least (9 - 13%). Finally, 75% of teachers paid attention to the quality, effectiveness, and relevance of their own tests. Based on the results, Stiggins and Conklin (1992) recommended professional development on assessment purposes and methods, the appropriate use of assessment data, strategies for providing feedback to students, and alignment with objectives and standards. High school teachers used a variety of assessment approaches. Multiple-choice are the most ubiquitously used (71%), and essays being the least used tool of measurement (37%). However, instead of

using assessment information to gauge students' mastery of subjects, teachers used them to rank students (Frary, Cross & Weber, 1993).

Bol, Stephenson, and Nunnery (1998) measured the impact of teaching experience, grade level, and content area on classroom assessment practices of 893 teachers in a Southern United States urban district. Teachers were asked to provide information regarding three factors related to their classroom assessment practices: 1) how frequently they use various assessments, 2) how they prepare and develop assessments, and 3) their beliefs about how well different assessment methods represented varying degrees of student performance. Interestingly, they found that teachers relied less on traditional methods to assess achievement. Instead, they favored alternative assessment methods, such as observations, contrary to the findings of previous researchers. Teachers stated that they believed these measures were more accurate in reflecting student achievement than traditional methods. Furthermore, their findings revealed experience influenced the method of assessment used, with experienced teachers and elementary teachers using alternative methods of assessment more frequently than teachers with lesser experience, and higher school teachers respectively. Math teachers were also found to use alternative assessment methods the least. However, it was unclear whether teachers were knowledgeable of the uses and specific measurement outcomes (e.g., higher level of processing versus lower levels of processing; mastery versus memorizing) of each of the assessment methods. This might have resulted in some misinterpretation because only 22% of the teachers indicated they used traditional methods, yet 55% said they used closed-ended, and 83% used open-ended questions.

More recently, Mertler (2005) developed the Assessment Literacy Inventory (ALI), a seven-item survey addressing the Standards, and the Classroom Assessment Literacy Inventory (CALI), an instrument developed prior to the ALI, in order to investigate teacher literacy in

classroom assessment. Mertler (2005) suggested a similar level of teacher literacy to what was found in previous studies. The findings of all studies suggest a sustaining trend of incompetence in assessment literacy.

Campbell and Evans (2000) studied 65 pre-service teachers enrolled in a teacher education program after they had recently completed a measurement course at a large mid-western state university. The researchers reviewed three hundred and nine lesson units completed by pre-service teachers in the measurement course. The measurement course that the pre-service teachers completed covered key areas of classroom assessment. The pre-service teachers received both peer and instructor feedback about their performance throughout the measurement course. It was hoped that this would narrow the gap between instruction and practice. The pre-service teachers were attached to schools to see if they could incorporate what they had learned into the classroom. The pre-service teachers were tasked with developing a lesson plan with assessment methods. Detailed guidelines were provided to pre-service teachers, with instructions to assess student learning and justify their instructional and assessment methods. It was assumed that the pre-service teachers would display knowledge of recommended measurement practices as a result of their recent training. Unfortunately, the pre-service teachers did not adhere to the guidelines recommended in their coursework. This was a surprising finding, because the pre-service teachers successfully completed the required measurement course and had been trained substantially in developing and critiquing assessment methods. It appeared that the pre-service teachers' failure to implement objective assessment practices to measure students' learning was not due to a lack of competence in classroom assessment (Campbell & Evans, 2000).

So far, researchers are in agreement that classroom assessment is important to facilitate teaching and learning. Multiple researchers are unanimous in their findings that teachers'

assessment literacy is low and that teachers may not have received sufficient training. As a result, teachers are either not using the right assessment methods in the right way, or they are unable to interpret the data correctly, or both. However, the teachers believed that they were sufficiently qualified in classroom assessment. Finally, the research is outdated, with the most recent findings being from more than a decade ago (Mertler, 2005).

The next sections of this literature review will address two issues. First, it appears that in spite of evidence to the contrary, teachers' perceptions and beliefs influence teachers' classroom assessment practices despite their lack of knowledge. There appears to be little recent research in classroom assessment competency; nevertheless, it affects teachers' beliefs and perceptions on their practices in the classroom. Relevant literature will be discussed in the upcoming section. Second, while there appears to be a gap in research in the United States, perhaps insight on assessment practices, training, and teacher assessment can be gleaned from a review of literature from a global perspective. This might help to answer key questions such as: a) does teacher training affect teacher literacy and competence in classroom assessment and, b) does teacher literacy and competence in classroom assessment translate into better assessment practices?

### **Teachers' Assessment Perceptions**

Teacher perceptions are an important aspect to consider because they influence teacher behavior in the classroom. This is especially true in relation to classroom assessment. As a result, the utility of assessment is often undermined by the perceived utility of the assessment. For example, teachers were found to teach focus their instruction on preparing students for standardized tests when they believed key decisions, such as student promotion, would be based on test scores. Unfortunately, there is little research on teachers' perceptions of classroom assessment and their own skills and competencies related to classroom assessment. However,

existing studies report similar findings on the importance of teachers' perceptions of classroom assessment and their competence in implementing classroom assessment.

In the second part of a study discussed earlier, Plake et al. (1993) asked surveyed participants on their perceptions of the usefulness of tests in making important decisions about their instructional practices and their confidence in interpreting standardized test scores. Eighty-six percent of the respondents stated that teacher made tests were important to making instructional decisions and enhancing instructions, but only 34% felt that standardized tests for effective for the same purpose. Fifty-three percent of the respondents expressed moderate comfort in interpreting standardized test scores. Plake et al. (1993) found that teachers who felt more comfortable in interpreting standardized tests scored significantly higher on the competency instrument than teachers who felt less comfortable. Teachers who had some assessment training scored significantly higher in the questionnaire on background and perceptions than those who had not. Thirty-five percent of the respondents were interested in improving their ability to interpret standardized test scores and assessment practices. A statistically significant relationship was found between teachers' level of comfort in interpreting standardized test scores and their level of interest in improving their assessment knowledge and practices. Teachers with low interest in becoming more proficient were those who were least comfortable. While teachers' perceptions of assessment practices were investigated in relation to training, experience, interest, and comfort level, they were not examined in terms of other potentially important variables such as grade level and content area taught. Teachers' perceptions of their skill level were also not correlated with their competency, which would have provided more insight.

Adams and Hsu (1998) investigated the relationship between teachers' beliefs about assessment and their assessment practices. Two hundred and sixty-nine grades one to four mathematics teachers in a southeastern US state completed a cross-sectional, 83 item survey. The relationships between grade level and teachers' beliefs about assessment and between grade level and teachers' assessment practices were examined. There were no significant relationships between teachers' beliefs of assessment techniques and practices and grade level. All teachers rated all assessment techniques as valid. However, significant differences were found in the use of homework and teacher-made tests. The level of importance that teachers placed on different forms of assessment (such as open-ended responses, homework, and teacher made tests) varied based on the grade levels that teachers taught. For example, third and fourth grade level mathematics teachers considered homework to be more important than first and second grade level teachers (Adams & Hsu, 1998). Teachers' beliefs indicate which assessment methods and practices are more important and useful in classroom assessment. This study does not examine teachers' perceptions of their skill level in engaging in assessment activities. This study also does not provide an explanation of teachers' misguided beliefs that they are highly skilled in assessment even though they are found to be underprepared and underqualified to implement classroom assessment, it does show that teachers' perceptions of what is important affects their classroom assessment practices.

Zhang and Burry-Stock (2003) examined the relationship between teachers' assessment practices and self-perceived assessment skills. They also examined the differences in classroom assessment practices between teachers of different grade levels and content areas, varying degrees of self-perceived assessment skills, years of teaching experience, and assessment training. Two hundred and ninety-seven teachers from two school districts (one rural and

suburban, and on urban) were sampled. The participants were surveyed using the Assessment Practices Inventory developed by Zhang and Burry-Stock (1994). Teachers from six elementary schools, four middle schools, and six high schools participated in the study. The results indicate that assessment practices and self-perceived assessment skills had a strong positive correlation ( $r = 0.71$ ).

Next, Zhang and Burry-Stock (2003) compared teachers' use of classroom assessment, and found that as grade level increased, so did teachers' use of objective techniques in classroom assessment, similar to the earlier findings of Adams and Hsu (1998). Furthermore, concern for assessment quality increased with grade level. Secondary teachers relied mostly on paper-pencil tests and placed a higher importance on the quality of assessment compared to elementary teachers. Elementary teachers placed a lower emphasis on performance assessment in favor of other alternatives and were not as concerned with the quality of assessment.

Zhang and Burry-Stock (2003) also found that content area affected teachers' assessment practices. Teachers of academic subjects, such as language arts, STEM and social studies used paper-pencil tests more often than teachers of non-academic subjects, such as arts, home-economics, keyboard, music and physical education. Teachers of non-academic subjects were grouped together. Overall, teachers of academic subjects more frequently used paper-pencil tests, engaged in interpreting standardized tests, revising tests, and worked on improving instruction based on assessment results compared teachers of non-academic subjects. Mathematics and language arts teachers reported more frequently conforming to the assessment Standards than did teachers of non-academic subjects. Finally, mathematics and science teachers reported grading on non-achievement-related factors (such as motivation and effort) more frequently than did teachers in social studies and non-academic subjects. Zhang and Burry-Stock (2003) suggest that

this could be because of teachers' beliefs that motivation and effort have an impact on achievement, in spite of this practice being discouraged in measurement communities.

Finally, Zhang and Burry-Stock (2003) also found significant effects for assessment training. Teachers who received assessment training perceived themselves to be more skilled than those without assessment training regardless of their teaching experience. However, no significant main effects were found for teaching experience, suggesting that teachers do not learn assessment on the job. There were also no significant interactions between teaching experience and measurement training. However, this study did not investigate whether teachers were as skilled in assessment as they believed themselves to be. Neither teachers' years of teaching experience, self-perceived measurement skills, nor their measurement training were measured against the other variables, such as content area and grade level. It would be interesting to know if the teachers who were more prone to using objective assessment measures were the ones who received training in measurement or had a higher perception of assessment skills.

Zhang and Berry-Stock (2003) stated that literature is limited in the investigation of assessment-related perceptions and practices. Unfortunately, this is still the case today. This gap suggests a need to explore the impact of teachers' perceptions in relation to classroom assessment skills, knowledge, and practices. Researchers describe different instruments that were designed to measure teacher competence in classroom assessment and teacher perceptions of their skills in classroom assessment. The instruments, although based on the 1990 Standards, ask different questions, and vary in length and reliability. The next section will attempt to summarize the instruments used.



## Summary of Instruments Based on the 1990 Standards

The Assessment Literacy Inventory (ALI), the Assessment Practices Inventory (API), the Classroom Assessment Literacy Inventory (CALI), and the Teacher Assessment Literacy Questionnaire (TALQ) are the most popular instruments being used presently and will be discussed in further detail in this section. The TALQ, being the earliest of the above-mentioned instruments to be developed, was the basis for the other three instruments.

The TALQ (Plake et al., 1993) is a 35-item instrument that measures in-service teachers' competency in the seven standards. Each standard is measured by five items. The instrument was administered to a sample of 555 in-service teachers across the USA. The internal consistency reliability estimate was 0.54, and the average score was 23.2 (SD= 3.3) (Plake et al., 1993).

The CALI (Mertler, 2003) measures competency of both in-service and pre-service teachers. It consists of the same 35 content-based items as the TALQ with additional questions on teacher background. It was administered to 197 in-service teachers, and the internal consistency reliability estimate for this sample was 0.57. It was also administered to 220 pre-service teachers and the internal consistency reliability estimate was 0.74. When scores were compared, in-service teachers' average scores were higher (22, SD= 3.4) than on pre-service respondents' average scores (19, SD= 4.7), (Mertler, 2003).

The ALI (Mertler & Campbell, 2005) consisted of 35 items and presented five classroom assessment scenarios with seven questions per scenario. The instrument was administered to 250 pre-service teachers and the internal consistency reliability estimate was 0.74. On average respondents received a score of 24 (SD= 4.6) (Mertler & Campbell, 2005).

Unlike the TALQ, ALI and CALI, which all measure teacher assessment competency, the API (Zhang & Burry-stock, 1997) measure teachers' perceptions of their assessment skills. The

instrument consists of 67 items measured on a 7-point likert scale that ranges from 1 (not confident) to 7 (very confident). The API was administered to 297 in-service teachers. Items were grouped into seven subscales: 1) Perceived Skillfulness in Using Paper-Pencil Tests (16 items); 2) Perceived Skillfulness in Standardized Testing, Test Revision, and Instructional Improvement (14 items); 3) Perceived Skillfulness in Using Performance Assessment (10 items); 4) Perceived Skillfulness in Communicating Assessment Results (9 items); 5) Perceived Skillfulness in Non achievement-Based Grading (6 items); 6) Perceived Skillfulness in Grading and Test Validity (10 items); and 7) Perceived Skillfulness in Addressing Ethical Concerns (2 items). The internal consistency reliability estimate for the teacher perceptions portion of the instrument was 0.97 and 0.94 for the assessment practices portion of the instrument (Zhang & Burry-stock, 1997).

While these instruments are by no means ideal in measuring present assessment competency and perceptions, instruments that have been developed more recently have not been found. Even if instruments had been developed recently, they could still be inappropriate to the current classroom context because they would still be based on the 1990 Standards. Unfortunately, there have not been recent studies on in-service assessment knowledge and practices, or on pre-service assessment education to inform whether the 1990 Standards are still the basis for classroom assessment, or if there has been a change in the recent years.

To date, the questions posed in the previous section remain unanswered. In the next section, studies on classroom assessment from Asian countries will be examined to understand whether: 1) teacher training affects teacher literacy and competence in classroom assessment, 2) teacher literacy and competence in classroom assessment translates into better assessment

practices, and 3) teachers' perceptions and beliefs influence their classroom assessment practices despite a lack of knowledge.

### **Asian Classroom Assessment Practices**

Students from East Asian countries consistently outperform students around the world in science, mathematics, and reading in the Program for International Student Assessment (PISA). PISA is administered by the Organization for Economic Cooperation and Development (OECD) to assess education systems around the world. The test is administered to 15-year-old students in over 70 countries and their performance is compared and ranked. The test is two hours long, and designed to assess students' cognitive and problem solving skills in science, math, and reading. Typically, students from Singapore, Japan, Taiwan, Vietnam, and China are among the top performers (Venkatachalam, 2017). Given the performance of students in East Asia, it is worth investigating assessment practices in East Asian Countries to understand what they may be doing differently. Unfortunately, research on assessment practices in Asian countries is limited. Therefore, it is difficult to gain a general understanding of the assessment practices, training and education programs, and teacher assessment literacy and perception in East Asian countries. A few studies are discussed below.

In Singapore, teachers' assessment practices focus on repetition and practice of knowledge and skills. Teachers of mathematics, science, and English state that their assessment practices were to prepare students for exams due to the focus on high-stakes testing in Singapore (Koh and Luke, 2009). In a study examining the quality of teacher assignments and student work in Singapore schools, Koh and Luke (2009) developed two sets of criteria and scoring rubrics on principles of "authentic assessment" (p. 4). Teachers were trained judge the quality of

assignments and student work. Koh and Luke (2009) define authentic assessments as assessments that measure higher-order cognitive abilities. All criteria were scored on a 4-point rating scale (1 = no requirement/no demonstration to 4 = high requirement/high level). Fifty-nine schools (30 elementary schools and 29 high schools) in Singapore were selected through random stratified sampling. A total of 6,526 samples of teachers' assignments and associated student work from Grade 5 and Grade 9 lessons of English, social studies, mathematics, and science over a period of two years (2004-2005) were collected for the purpose of the study. The types of assignments included in-class assignments, homework assignments, projects, and teacher-made tests. Samples of assignments were categorized into high-quality, medium-quality, and low-quality student work.

Koh and Luke (2009) found the teachers' assessment tasks were focused on classwork, compared to other types of assessment tasks. In total, the classwork assignments accounted for 80.4% for Grade 5 and 65% for Grade 9 of all student work.

All teachers assigned homework more than conducting tests or assigning projects. There was also limited focus on tasks of extended duration and complexity. Most of the tests were teacher-made and were summative in nature.

The authentic intellectual quality of teachers' assignments and student work differed significantly across subject area. Subject area effect was large, with social studies differing significantly from the other subject areas in authenticity and knowledge domains. Koh and Luke (2009) state that this makes sense because social studies teachers prioritized syllabus requirements over teaching to the test. As a result, assessments were focused on problem solving and critiquing of important social issues. Quality of teachers' assignment tasks and student work were strongly correlated, where quality of student work increased as quality of teachers'

assignments increased, and vice versa. Although Singapore students excel in high-stakes tests, Koh and Luke (2009) suggest that training teachers in authentic intellectual assessment tasks can enhance student learning and performance. They argued that shifting assessment focus from high-stakes preparation to assessment tasks that require students to demonstrate authentic intellectual capacities will improve student performance and quality of work. This study reinforces the role of assessment in facilitating learning and performance. Although teachers' use of assessment methods varies based on variables such as subject area taught and grade level, it significantly affects student performance and quality of work.

Alkharusi, Aldhafri, Alnabhani and Alkalbani (2012) explored classroom assessment attitudes, competence, knowledge, and practices of 165 randomly selected in-service Omani teachers. Teachers taught Arabic, English, mathematics, Islamic education, science and social studies. Teacher experience varied from one to 20 years. One hundred forty-six teachers took at least one course in educational assessment during their pre-service preparation, 67 teachers had at least one in-service workshop training in educational assessment, and 98 teachers did not have any training in the educational assessment. The study attempted to describe teachers': 1) attitudes towards, practices in, and knowledge of educational assessment, 2) uses of and attitudes towards classroom tests, and 3) perceptions of their competence in educational assessments.

It was found that a majority of the teachers (68.5%) held an overall favorable attitude towards classroom assessment. Teachers' attitude towards classroom assessment differed significantly based on the subject they taught.

Alkharusi et al. (2012) also found that although teachers perceived themselves as being highly competent (73.5%) or moderately competent (25%) in educational assessment, their classroom assessment competence was low. Female teachers demonstrated higher competence

than male teachers in classroom assessment regardless of content area taught, grade level and, assessment training. There was no relationship between teaching experience and teacher's overall competence in the educational assessment, nor between teachers' classroom assessment competence and classroom assessment practices. These results are consistent with earlier findings

Overall, teachers scored poorly on the test of assessment competence, with 75% scoring 15 items out of 32 items correctly. There were significant differences in assessment competence with respect to gender, subject, and in-service training in assessment. Female teachers had a higher level of educational assessment knowledge than male teachers, as did teachers with in-service training compared to teachers with no in-service training. Mathematics and science teachers were more knowledgeable in classroom assessment than English teachers and social studies teachers. Teachers primarily used assessment results for assigning grades and motivating students to learn, although this was not consistent across gender, grade level, and subject area. These results are also consistent with findings from earlier studies. Alkharusi et al. (2012) suggest taking a qualitative research approach in future studies to validate the findings in this study.

The discourse on East Asian classroom assessment is more recent than in the USA. Nonetheless, it is still lacking. A review of studies conducted in Asia and the USA revealed that assessment training had mixed results relative to assessment knowledge and competence, with some countries having favorable results, but other countries, such as the USA, not having much success in terms of assessment training and competence. While this section answers questions raised in previous sections, the results are far from conclusive. The countries examined were diverse and different, therefore, it is difficult to generalize results. It is also difficult to determine

whether these findings can be replicated in different countries. One commonality that all these countries appear to have is the emphasis of curriculum on rote-learning and high-stakes testing. Interestingly, East-Asian countries appear to outperform the rest of the world in international education evaluation. One Asian country not represented in PISA or in classroom assessment research is India. Due to its size, population, and role as an economic power in Asia (Venkatachalam, 2017), it should be considered.

### **Classroom Assessment in the Indian Context**

According to Venkatachalam (2017) India refused to participate in PISA since ranking 72nd among the 74 countries in 2009. India perceived that there was a socio-cultural gap between the survey questions and Indian students. The Indian government found that many university graduates in India were unable to apply their knowledge in real-life situations due to emphasis on high-stakes testing and scores, rather than students' learning and ability to apply knowledge (Venkatachalam, 2017).

Kapur (2008) explained that the present system of assessment and evaluation for school education in India is exam-oriented. Therefore, it focuses only on cognitive learning outcomes, rote-learning, and memorization. Higher order cognitive abilities such as critical thinking, problem solving, and creative ability are neglected. In 2005, the National Curriculum Framework was developed to examine every aspect of school education and recommended reforms of evaluation and assessment in order to prepare students to be innovative problem-solvers. Nonetheless, the systems remained the same, with examinations remaining the basis of educational assessment and evaluation, while learning remained neglected, resulting in a lower quality of learners (Kapur, 2008).

In 2013, the National Committee on School Education (NCSE) in India conducted an

evaluation of teacher educators believing them to be the backbone of the entire education system. The NCSE observed a shortage of qualified teachers in India. The evaluation investigated teacher educators' skills, competencies, and effectiveness as well as gaps in the current teacher education curriculum.

Teacher educators' professional preparation was examined through a semi-structured qualitative survey. Specifically, curriculum, policies and practices of teacher educator training was explored. A survey was administered in 20 teacher-training institutes in nine states through a semi-structured qualitative questionnaire. Teacher educators and Masters in Education (M.Ed.) students in 20 teacher-training institutes in nine states participated in the evaluation. The evaluation examined M.Ed. curriculum for evidence of novel as well as existing teaching and learning methodologies. Teacher educator programs were also evaluated based on their responsiveness to policy changes.

The evaluation revealed that the M.Ed. curriculum did not offer sufficient preparation for teacher educators. It was stated that the M.Ed. program did not offer subject-oriented and stage-specific teacher education. A need for redesigning teacher education programs was expressed, with a focus on upgrading teachers' knowledge of the subjects they teach, improving teaching proficiency, and increasing awareness of developments in the society. It was also suggested that appropriate training curriculum and materials were required (Confederation of Indian Industry, 2013).

The NCSE stated that the quality of education in India is poor and they blamed this on the quality of teacher educator curriculum and training. Although the NCSE identified a large hole in India's education system, the issue of classroom assessment was ignored. There is no published research on academic achievement practices in India, nor is there an indication of



whether teachers are trained in assessment. There are no published standards for assessment or measurement competency in India. Assessment and evaluation of student aptitude in India is exam based and highly competitive in nature (Kapur, 2008; Venkatachalam, 2017). India does not participate in international education assessment programs, such as PISA, which are important in providing valuable insight and feedback regarding a country's education system, and in doing so, shaping educational reform (OECD, 2017). Nonetheless, the Indian government envisions India as a global economic power by 2020. In order to do so, not only does the government have to allocate more resources to education, but also needs to improve education standards in schools (Venkatachalam, 2017).

### **Self – Efficacy**

Educational researchers generally agree that beliefs are an important mediator in teachers' practice (Kagan, 1992; Pajares, 1992; Rios, 1996a). Beliefs serve as a filter that affects teachers' perceptions, interpretations, and actions (Pajares, 1992; Rokeach, 1968). Several lines of inquiry regarding beliefs have emerged such as self-concept, self-esteem, self-efficacy (Bandura, 1986), attributions, and goals of learning. Under the broad umbrella of teacher beliefs, teacher self-efficacy is one aspect that has been characterized as part of teachers' framework for decision-making (Rimm-Kaufman & Sawyer, 2004) and is often researched alongside other beliefs and attitudes (e.g. Andersen et al., 2004; Charalambous & Philippou, 2010).

The theory of self-efficacy proposes that it is possible to intentionally influence one's own behavior and environment. Although people are influenced by the environment, this theory suggests that they are agents of their own will (Bandura, 2006). In addition, people possess the ability to self-reflect, allowing for the evaluation of one's thinking and behavior, and as a result, form perceptions of self-efficacy. Self-efficacy, or the belief in one's abilities to succeed in

certain activities, influences multiple factors that contribute to achievement in those activities. High self-efficacy increases performance, interest and effort in tasks, and persistence when tasks are difficult. Furthermore, people with higher self-efficacy tend to set higher goals (Usher & Pajares, 2006). Research on teachers' self-efficacy and its influences on their practices also indicate that teachers with higher self-efficacy not only persist longer, but also exhibit greater academic focus in classrooms and provide different types of feedback to students as compared to teachers with low self-efficacy (de Laat and Watters, 1995).

Research on self-efficacy in education is heavily focused on students. Nonetheless, the theoretical implications are valuable. For example, Usher and Pajares (2006) explored the effects of four hypothesized sources of self-efficacy on the academic and self-regulatory efficacy beliefs of middle-school students. They found that mastery experience was the strongest predictor of academic and self-regulatory self-efficacy, although this was only observed in high achieving students and not low achieving students. It was explained that this is due to high achieving students interpreting their achievements as their efforts being successful, resulting in confidence in successfully completing similar tasks in the future. Failure in a task is interpreted as something that can be easily corrected with increased effort. Conversely, low achieving students perceive challenging tasks as personal threats and experience difficulty recovering from failure (Usher & Pajares, 2006). This finding suggests that people with higher self-efficacy focus on positive past outcomes, which leads to higher future achievement, and as a result, perceive failures more positively.

**Teacher Self-Efficacy.** There is disagreement on the operational definition of teacher self-efficacy, although some researchers default to defining it as teacher beliefs (Soodak & Podell, 1996; Wheatley, 2005). Researchers' conceptualizations of teacher self-efficacy are

derived either from the concept of internal and external control (Rotter, 1966), or Bandura's (1997) conceptualization of self-efficacy. Rotter believed that teacher self-efficacy increases or decreases according to internal (factors influenced by the teacher, such as instruction) and external (factors outside of teachers control, such as students' abilities) control. If teachers believe that they can influence students' achievement, their self-efficacy increases. Conversely, if teachers believe that external factors such as student abilities influence student's achievement, teacher self-efficacy decreases (Guskey & Passaro, 1994; Rose & Medway, 1981).

Bandura explained self-efficacy as "beliefs in one's own capability to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). That is, teachers' self-efficacy increases or decreases based on teachers beliefs in their own abilities to perform activities to attain goals. For example, a teacher will have high self-efficacy in teaching if the teacher believes that he or she has the ability to prepare and carry out educational activities (e.g. instruction) that would impact student achievement.

While high self-efficacy will increase the expectation of a positive outcome when performing an academic task, Schunk and Pajares (2009) point out that, within a classroom context, a student high in self-efficacy who does not expect a positive outcome as a result of successful performance of the task may choose to not perform the task. Students predict whether they can successfully perform a task based on their ability beliefs. As a result, even a student with high generally self-efficacy might feel that successfully performing a task might not produce the desired results, leading to avoidance of the task. This highlights the importance of self-efficacy.

Self-efficacy consists of efficacy expectations. In other words, the belief that one can successfully engage in a particular behavior in order to achieve certain outcomes and outcome

expectancies or “a person’s estimate that a given behavior will lead to certain outcomes” (Bandura, 1977, p. 193). The difference between efficacy expectations and outcome expectancies is that while individuals may be particularly confident that performing an activity will produce a desired outcome, they may not be particularly confident that they have the ability to successfully perform that activity. Outcome expectancies can have an impact on one’s decision to engage in a task. For example, when performing an academic task, high self-efficacy will increase the expectation of a positive outcome. However, a student high in self-efficacy who does not expect a positive outcome as a result of successful performance of the task may choose to not perform the task (Schunk & Pajares, 2009). Students get a sense of whether they can successfully perform the task as a result of their ability beliefs of whether they can successfully perform the task and on the belief that successful performance of a task will bring about desired results.

Pajares and Graham (1999) state that self-efficacy contributed to performance above and beyond other motivational variables such as anxiety, value, or engagement and that, in a correlational study of math performance and self-efficacy, self-efficacy predicted math performance at both the beginning and end of the year, although math self-efficacy levels decreased across time. Likewise, self - efficacy levels of teachers do not remain unaffected. In fact, they may even decline over the years. Woolfolk, Hoy, & Spero (2005) studied the self-efficacies of pre-service teachers at the start of their teacher education to the end of their first year of teaching. These teachers’ efficacy scores declined by the end of their first year of teaching. Woolfolk et al. (2005) observed a correlation between participants’ self-efficacy scores and their perceived support in the school environment.

According to Bandura (1977), self-efficacy is a domain-specific construct. That is, one can have low self-efficacy in one academic domain like math, but have a high general academic self-concept (Schunk, 1991). Lent, Brown and Gore, 1997 state that self-efficacy in a specific area is a better predictor of performance in that area compared to overall self-efficacy.

Raudenbush, Rowan, and Cheong (1992) found that teacher self-efficacy is affected by grade level taught, content area taught, student body characteristics, and the teachers' perceptions of their own skills.

**Self-concept of ability.** People observe and interpret their behavior and the behavior of others to assess their own competency to perform specific tasks (Eccles et al., 1983). This is known as self-concept of ability. In other words, self-concept of ability is the perception of one's own skills in performing a task. Researchers have found self-concept of ability and expectancy are highly related (Eccles & Wigfield, 1995; Wigfield, 1994; Wigfield & Eccles, 2000).

Ability beliefs influence expectancies of success and self-efficacy. Furthermore, there is even evidence that they are called on when assessing efficacy expectations on unfamiliar tasks. For example, when students are presented with a task, they draw on previously established ability beliefs to determine their ability belief for that task. However, when presented with a novel task, there is no reference point from previous experience, so it is students may draw upon previously established ability beliefs from similar experiences to determine their ability belief and efficacy expectations for that novel task (Gorges & Göke, 2015).

Researchers have examined relationships between teacher self-efficacy and classroom practice through looking at general activities and particular pedagogical approaches (Schriver & Czerniak, 1999; Andersen et al., 2004; Brand & Moore, 2011). High teacher self-efficacy is related to persistence at tasks, risk taking and use of innovations in the classroom. Teachers with

high self-efficacy are more likely to use enquiry and student-centered pedagogies in science than teachers with low self-efficacy. Furthermore, teacher self-efficacy contributes to understanding and use of enquiry-based teaching in professional development (Schriver & Czerniak, 1999; Andersen et al., 2004; Brand & Moore, 2011). However, in studies of pre-service teachers and their self-efficacy, relationships between teacher self-efficacy and practice were inconsistent with existing literature on teacher self-efficacy and classroom practice. Haverback (2009) found no link between teacher self-efficacy and pre-service teachers' use of multiple reading strategies. Gerges (2001) found no significant relationship with pre-service teachers' use of a variety of instructional approaches. Follow-up interviews with participants revealed that other teacher beliefs overrode the influence of teacher self-efficacy, such as beliefs about pedagogical knowledge and students' developmental abilities.

In all of the studies however, teacher self-efficacy has not been directly studied with teacher competence, nor has it been studied with teachers' perception of their skills. Furthermore, researchers studying the relationship between teacher self-efficacy and classroom practice have not considered teachers' classroom assessment practices or knowledge as variables. However, because self-efficacy is domain specific, it is important to investigate its impact on teacher' classroom assessment practices in spite of positive findings on teacher self-efficacy and general classroom practice behaviors.

Content area taught was found to affect teachers' classroom assessment practices and perceptions (Zhang & Burry-Stock, 2003) and teacher beliefs and perceptions were found to affect classroom practices (McMillan, 2003). Because relationships between self-efficacy and perceptions and beliefs were found by other researchers, it is hypothesized that 1) these relationships will be observed within an Indian context as well, and 2) in this study, relationships

will be found between self-efficacy, content area, and classroom assessment practices (Kagan, 1992; Pajares, 1992; Rios, 1996a; Woolfolk et al., 2005). The observed decline of self-efficacy as years of teaching experience increase (Woolfolk, Hoy, & Spero, 2005) is also expected to be consistent within the Indian context as is the relationship between competence and self-efficacy (Usher & Pajares, 2006).

### **Current Study**

Researchers have identified a gap between teacher competence in classroom assessment and their perceptions of their competence. However, the factors that influence teacher assessment competence and perception of skills, such as teacher demographics and background, have not been considered. How these variables interact and the effects they have on each other have not been studied. The purpose of this study is to explore these variables within a different cultural context. Specifically, the purpose of this quantitative study is to understand assessment competence, practices, and self-perceived assessment skills of teachers in India. The research questions addressed in this study are described below.

### **Research Questions**

- 1) What are the relationships between teacher background and demographic factors (such as assessment training, content area, and grade level), teacher competency, teacher self-efficacy, and teacher perception of assessment skills have on classroom assessment practices in India?
- 2) What are the relationships between teacher background and demographic factors (such as assessment training, content area, and grade level) have on classroom assessment

practices in India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills?

- 3) How do teacher assessment competence, teacher perception of assessment skills, teacher self-efficacy, and teacher assessment practices differ based on teacher demographics and background?

## Summary

This chapter reviewed relevant literature, followed by the questions that the research proposes to answer. This review of the literature presented the gaps in assessment research. It highlighted the need for inquiry and analysis of the impact of teacher background, assessment competence, teacher self-efficacy, and teacher perception of assessment skills on classroom practices and provides the foundation for this research. This review provided a brief overview of the importance of classroom assessment for learning and of the development of student assessment in schools in the United States of America. Then, this review of the literature explained teachers' role in classroom assessment and student learning and outlined the gaps in teacher knowledge of classroom assessment. Specifically, the gaps in teacher knowledge of classroom assessment were outlined and discussed in two parts: 1) teacher competence and 2) teacher perceptions of their competence. The variables that influence teacher assessment competence and perception of skills, such as teacher demographics and background (i.e., years of teaching experience, competency, content areas, and measurement training), were identified and explored. In order to understand the impact of cultural context on teacher assessment competence, perception of skills and teacher assessment practices, studies conducted in Asia were documented, and the education system in India was introduced to provide a contextual framework for this study. The focus of the current study was briefly described, and the research



questions were listed. The next chapter will focus on the research methods and data analysis that will be performed in this study.

## Chapter 3

### Methodology

This chapter presents the research questions that drive this study and provides a description of the methods used to examine the relationships between teachers' assessment competence and self-perceived assessment skills on their classroom practices, how self-perceived assessment skills are affected by years of teaching experience, grade levels, gender, competency, content areas, and measurement training. This chapter examines the problem, significance, and purpose of the study, and describes the research design, sample used, and data collection procedures. The variables examined in this study will be described and reliability estimates for the instruments used will be provided. Validity of the instrument will also be addressed. Finally, an overview of the proposed data analysis will be provided.

#### Problem and Significance

The emphasis on high-stakes testing in the US resulted in teachers teaching to the test rather than focusing instruction on enhancing student learning (Nichols & Berliner 2007). This tendency is also evidenced in India, where students are taught to the test and are unable to apply knowledge to real world contexts (Venkatachalam, 2017). Policy-makers, school officials, and teachers in India are uninformed on the relationship between classroom assessment practices and students' learning. The NCSE evaluation states that teachers are not sufficiently trained because of teacher educators being ill-equipped to train teachers (Confederation of Indian Industry, 2013). Classroom assessment was not discussed, but it was recommended that teacher educator training be reformed in order to ensure teacher educators are better qualified to train pre-service teachers. It is assumed that this will fix the problem of unqualified teachers, which will then solve the problem of low-quality education in India. Nonetheless, it is uncertain how qualified

teachers are in classroom assessment. Specifically, it is unknown what teachers' competence in classroom assessment is and how it affects their classroom assessment practices. While that might be only part of a concern of the government of India, given the importance of classroom assessment, it is worth investigating teachers' competence and perceptions of their classroom assessment skills and how this affects classroom assessment practices in India.

### **Purpose of the study**

The purpose of this study is to describe teacher assessment competence, practices, and teachers' self-efficacy and self-perceived assessment skills in South Central India. The goals of this study are to understand the relationships between teacher background (i.e. content area, and years of teaching experience) classroom assessment competence, practices, self-efficacy, and self-perceived assessment skills of teachers in South Central India. Specifically, this quantitative study attempted to understand:

- 1) The relationships between teacher background, teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in South Central India.
- 2) The relationships between teacher background on classroom assessment practices in South Central India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills.
- 3) The differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background

Teacher's classroom assessment practices affect student performance. According to Stiggins (1991), teachers spend a lot of their time in the classroom in assessment-related activities.

Therefore, teachers need to have competency in classroom assessment. Unfortunately, this is not

the case. Given the impact on student achievement, teachers' competency levels in assessment and their perceived skills in classroom assessment, and how these are related to classroom assessment practices, are important to study. Furthermore, the individual assessment choices teachers make within their classroom and whether teacher demographics and background relate to these choices are also worth studying. The classroom assessment situation in India is unclear, because much is unknown and left to presuppositions. This makes it all the more important and interesting to investigate, given the role of India as an economic entity in the world.

### **Research Design**

This study employed correlational design. This quantitative study used survey procedures to collect data to answer the proposed research questions. A cross-sectional survey was used to collect data from the selected sample at a single point in time. This study is a single, stand-alone study. This design was selected because the purpose of this study is to provide an understanding of the behaviors, attitudes, and knowledge of the selected sample in relation to classroom assessment. Quantifiable information was collected from all members of the sample through a structured questionnaire. In order to collect standardized data that is comparable from all the participants, the same instrument was distributed to the entire population at the same time through an online survey website.

### **Sample**

Data were collected from schools in two states in the South Central region of India. It was hoped that teachers from all states in India would participate in this study, but the response rate from other states was low and responses were incomplete, resulting in the data being unusable. A total of 214 grade 6-12 teachers participated in the study.

## Data Collection Procedures

**Instrument.** A self-report questionnaire of four parts was used in this study. The first part focused on the background and demographic information of the participants including gender, current grade level, teaching subject, and teaching experience (see Appendix A). The second part of the questionnaire was adapted from Plake et al.'s (1993) questionnaire on teacher assessment competence regarding classroom assessment and consisted of 35 items. All items followed a multiple-choice format, with one correct answer (see Appendix B). This part of the questionnaire was graded by the author using an answer key developed by Plake et al., 1993. The third part of the questionnaire was adapted from Zhang and Burry-Stock's API (1997) and measured a) in-service teachers' perceptions of their assessment skills and b) classroom assessment practices (see Appendix C). The third part of the questionnaire consisted of 67 items that are measured by a 5-point Likert scale with scores ranging from 1 (not at all skilled) to 5 (very skilled) for part (a) and 1 (not at all used) to 2 (used very often) for part (b). The fourth part of the questionnaire consisted of 10 Likert scale items on teacher self-efficacy by Schwarzer, Schmitz, and Daytner, (1999) (see Appendix D). Scores for this part of the questionnaire ranged from one to four (1-not at all true, 2-barely true, 3-moderately true, 4-exactly true).

**Instrument Adaptation.** The original questionnaires by Plake et al. (1993), Zhang and Burry-Stock (1997) and Schwarzer, Schmitz, & Daytner, (1999) were shared with a Principal of a high school in India via email. The questionnaires were reviewed and some language in the TALQ (Plake et al. (1993) was modified according to the principal's suggestions to make it more appropriate to the Indian context (e.g., standard instead of grade, names used, marks instead of grades).

**Procedure.** The entire questionnaire was uploaded onto the online survey software, Qualtrics, and the survey link was shared with principals of public schools in two states in South Central India to distribute to all teachers in their schools. Teachers also shared the survey link with other teachers whom they thought might be interested in participating in the study.

### **Research Questions**

The following research questions will be addressed in this study:

- 1) What are the relationships between teacher background (i.e. content area, and years of teaching experience), teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices in South Central India?
- 2) What are the relationships between teacher background (i.e. content area, and years of teaching experience) on classroom assessment practices in South Central India mediated by teacher competency, teacher self-efficacy, and teacher perception of assessment skills?
- 3) What are the differences in teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices based on teacher background (i.e. content area, and years of teaching experience)?

## Variables

Table 1. *Variables*

IV		DV		
Years of Teaching Experience	Competency Level	Assessment practices	Self-perceived assessment skills	Self-Efficacy
Content Area				

The variables used in this study were identified and selected through the review of literature. Background and demographic information (teaching experience, training, content area taught) make up the independent variables. Teacher competence level, assessment practices, teacher self-efficacy, and self-perceived skills are included as dependent variables (Table 1). The independent variables, content area, and years of teaching experience are categorical variables. The independent variable teaching experience, and dependent variables, competency level, self-efficacy, and self-perceived assessment skills and assessment practices, are interval variables.

### Validity and Reliability

The TALQ (Plake et al., 1993) and the API (Zhang & Burry-Stock, 1994) have been tested for validity before use by the authors of the studies. In order to establish content validity in the adapted instrument for the present study, the questionnaire were given to experts in the areas of educational measurement, as well as an expert in the Indian education system. The experts judged the instrument based on its relevance to the construct being measured, and its

appropriateness to the Indian context. The questionnaire was refined accordingly. Reliabilities were calculated for each component of the questionnaire and are reported in Table 2.

Table 2. *Reliabilities*

Instrument	Reliability (Cronbach's Alpha)
TALQ	0.928
API (practices)	0.968
API (perceptions)	0.957
Teacher Self-Efficacy	0.905

### **Data Analysis**

The statistical software, SPSS and R, were used to analyze the quantitative data. Prior to addressing each question, descriptive statistics were run to provide an overview of the data collected in order to provide an overall understanding of the results and provide context with the use of means and standard deviations. Path analysis will be used to test the predictive effects of teacher background (i.e., level of teaching experience, assessment training, and content area), teacher competency, teacher self-efficacy, and teacher perception of assessment skills on classroom assessment practices (Figure 1 shows the hypothesized path analysis). Furthermore, path analysis will also be used to test mediating effects of background on classroom assessment practices through teacher competency, teacher self-efficacy, and teacher perception of assessment skills. Kruskal – Wallis, a non-parametric analysis was also conducted to examine within-group and between-group differences.



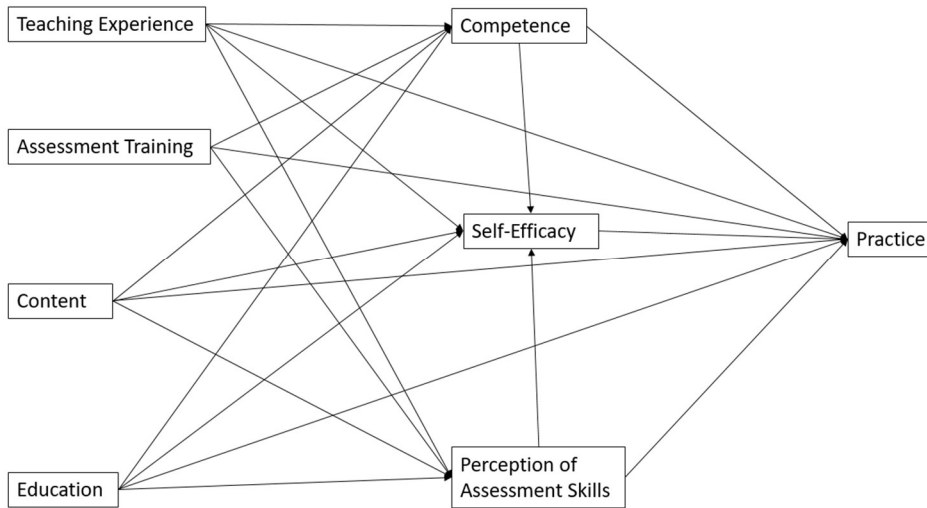
*Question 1: What are the relationships between teacher background (i.e. level of teaching experience, and content area), teacher competency, teacher self-efficacy and teacher perception of assessment skills have on classroom assessment practices in South Central India?*

In order to examine the predictive effects of teacher background (such as level of teaching experience, assessment training, and content area), teacher competency, teacher self-efficacy, and teacher perception of assessment skills, and the degree to which these factors predict classroom assessment practices in South Central India, a path analysis will be conducted for the total sample. For all analyses, an alpha level of  $p < .05$  will be selected as a threshold for confirming statistical significance.

*Question 2: What are the relationships between teacher background (i.e. level of teaching experience, and content area) have on classroom assessment practices in South Central India mediated by teacher competency and teacher perception of assessment skills?*

In order to examine the predictive effects of teacher background factors (such as level of teaching experience, assessment training, level of education, and content area) as mediated by teacher competency and teacher perception of assessment skills and the degree to which these factors predict classroom assessment practices in South Central India, a path analysis will be conducted for the total sample. For all analyses, an alpha level of  $p < .05$  will be selected as a threshold for confirming statistical significance.

Figure 1. *Hypothesized Path Model*



The relationships in the hypothesized path model (Figure 1) were identified in current literature and are described below. Teacher beliefs and perceptions were found to affect classroom practices (McMillan, 2003). Teachers lacking in adequate classroom assessment competence did not adhere to proper assessment practices (Campbell & Evans, 2000; Daniel & King, 1998). Classroom assessment training was found to affect classroom assessment practices and perceptions (Panizzon & Pegg, 2007). Years of experience was found to affect classroom assessment practices (Cizek et al., 1996). Content area taught was found to affect teachers' classroom assessment practices and perceptions (Zhang & Burry-Stock, 2003). Relationships between teaching experience and self-efficacy, self-efficacy and perception of skills, competence, and practices have been supported by other researchers (Kagan, 1992; Pajares, 1992; Rios, 1996a; Woolfolk et al., 2005). These relationships are expected to exist within the Indian context as well. The relationship between classroom assessment training, level of

education, and classroom assessment have not been investigated, and will be examined in the proposed path analysis. The relationship between content area taught, and self-efficacy, and perception of assessment skills have also not been investigated, and will be examined in this study.

*Question 3: How do teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices differ based on teacher background?*

i. *Years of experience*

ii. *Content Area*

Kruskal-Wallis, a non-parametric analysis was used to examine differences in teachers' competence in classroom assessment, perceptions of teachers' skills in educational assessment, and classroom assessment practices with respect to teachers' years of teaching experience, grade level, training in assessment, and content area.

Before conducting the analysis, Mahalanobis Distance, Leverage, and Cook's D were checked for consistency on influence. However, even after outliers were removed, assumptions of linearity, normality, multicollinearity and homogeneity of variance-covariance matrices were not met, as is required for a multivariate analysis. Scatterplots were examined to ensure that the assumption of linearity was met. Kurtosis and skewness values were checked to ensure that the assumption of normality was met. Finally, Levene's Test statistic was checked to ensure that the assumption of Homoscedasticity was met. However, upon a failure to meet assumptions, data were determined to not be normal, and Kruskal-Wallis, a non-parametric test was determined to be the best analysis for this question.

## Chapter 4

### Results

While the survey was distributed to teachers from multiple states in India through convenience sampling, only teachers from two states South Central India responded to the survey. A total of 214 teachers participated in this study. All the teachers had post-secondary degrees in Education, with 212 teachers having a bachelor's degree in Education, one with a master's degree in Education, and one teacher with a doctorate in Education. All teachers indicated they had some form of training in classroom assessment. All teachers taught in an English medium school (i.e., the language for instruction and curriculum is English) and had a good command over the English language. Teachers taught grades six to 12, with most teachers teaching multiple grades. Teachers' years of teaching experience ranged from one to 30 years. Due to a lack of variance in education level and classroom assessment training, these variables, although interesting, were excluded from the analyses. Furthermore, grade level taught, although investigated by previous researchers, was not investigated in this study because teachers taught multiple grade levels. Content area taught was divided into two groups, STEM and non-STEM as described in literature (Alkharusi et al., 2009; 2012; Zhang & Burry-Stock, 2003) and because teachers taught multiple subjects, making it complex to divide teachers into groups.

### Descriptive Statistics

One hundred thirty-three STEM teachers and 81 non-STEM teachers participated in the study. Years of teaching experience was treated as a continuous variable in the path analysis and mediation analysis. Teachers were divided into four groups based on the number of years of teaching experience for the Kruskal-wallis analysis: 1) 1-5 years (N = 32), 2) 6-10 years (N =

74), 3) 10-20 years (N = 81), and 4) >20 years (N = 27). This grouping was guided by the grouping by Alkharusi et al. 2009.

**Frequencies and Percentages.** The most frequently observed category of Content was STEM ( $n= 133, 62\%$ ). Frequencies and percentages are presented in Table 2.

Table 3. *Frequency Table for Nominal Variables*

Variable	<i>n</i>	%	Cumulative %
Content			
STEM	133	62.15	62.15
Non-STEM	81	37.85	100

*Note.* Due to rounding errors, percentages may not equal 100%.

**Summary Statistics.** The observations for Competence had an average of 0.47 ( $SD = 0.19, SE_M = 0.01, Min = 0.06, Max = 0.65, Skewness = -0.72, Kurtosis = -1.16$ ). The observations for Experience had an average of 11.95 ( $SD = 7.25, SE_M = 0.50, Min = 1.00, Max = 34.00, Skewness = 1.06, Kurtosis = 0.75$ ). The observations for Perception had an average of 3.68 ( $SD = 0.43, SE_M = 0.03, Min = 2.36, Max = 4.52, Skewness = -1.03, Kurtosis = 0.42$ ). The observations for Practices had an average of 3.63 ( $SD = 0.49, SE_M = 0.03, Min = 1.64, Max = 4.52, Skewness = -1.92, Kurtosis = 4.45$ ). The observations for Self-Efficacy had an average of 1.78 ( $SD = 0.32, SE_M = 0.02, Min = 0.80, Max = 2.00, Skewness = -1.50, Kurtosis = 1.47$ ). The summary statistics can be found in Table 3.

Table 4. Summary Statistics Table for Interval and Ratio Variables

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE<sub>M</sub></i>	Min	Max	Skewness	Kurtosis
Competence	0.47	0.19	214	0.01	0.06	0.65	-0.72	-1.16
Experience	11.95	7.25	214	0.50	1.00	34.00	1.06	0.75
Perception	3.68	0.43	214	0.03	2.36	4.52	-1.03	0.42
Practices	3.63	0.49	214	0.03	1.64	4.52	-1.92	4.45
Self-Efficacy	1.78	0.32	214	0.02	0.80	2.00	-1.50	1.47

**Normality.** Because the skewness and kurtosis values were close to the cut-offs, Shapiro-Wilk tests were conducted in order to determine whether the distributions of Experience, Practices, Perception, Self-Efficacy, and Competence were significantly different from a normal distribution. The following variables had distributions which significantly differed from normality based on an alpha of 0.05: Experience ( $W = 0.91, p < .001$ ), Practices ( $W = 0.79, p < .001$ ), Perception ( $W = 0.87, p < .001$ ), Self-Efficacy ( $W = 0.72, p < .001$ ), and Competence ( $W = 0.77, p < .001$ ), indicating that the assumption of normality was violated. The results are presented in Table 4.

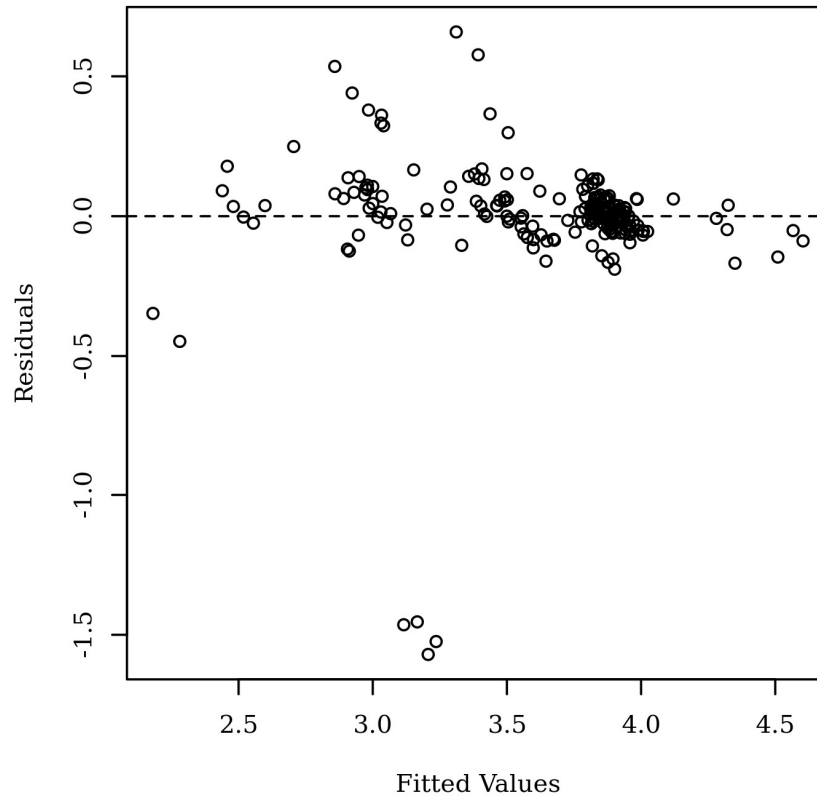
Table 5. Shapiro-Wilk Test Results

Variable	<i>W</i>	<i>p</i>
Experience	0.91	< .001
Practices	0.79	< .001
Perception	0.87	< .001
Self-Efficacy	0.72	< .001
Competence	0.77	< .001

**Homogeneity of Variance.** Levene's test was conducted for Practices, Perception, Self-Efficacy, and Competence by Content and Length to assess whether the homogeneity of variance assumption was met (Levene, 1960). The result of Levene's test for all the variables was significant, indicating that the assumption of homogeneity of variance was violated for all the variables. The test statistic statements for each variable are as follows: Practices ( $F(5, 208) = 7.45, p < .001$ ); Perception ( $F(5, 208) = 12.14, p < .001$ ); Self-Efficacy ( $F(5, 208) = 5.65, p < .001$ ); Competence ( $F(5, 208) = 15.09, p < .001$ ).

**Homoscedasticity.** Residuals were plotted against the predicted values to test if the assumption of homoscedasticity was met (Bates et al., 2014). In general, the residuals appear to grow larger, suggesting a violation of the assumption of homoscedasticity. Figure 2 presents a scatterplot of predicted values and model residuals.

Figure 2. Residuals scatterplot testing homoscedasticity.



**Multicollinearity.** Variance Inflation Factors (VIFs) were calculated to test if the assumption of multicollinearity was violated. VIFs greater than 5 are problematic as they indicate increased effects of multicollinearity in the model (Menard, 2009). All predictors in the regression model have VIFs less than 5. Therefore, the assumption of multicollinearity was not violated. Table 5 presents the VIF for each predictor in the model.



Table 6. *Variance Inflation Factors for Experience, Content, Length, Perception, Self-Efficacy, and Competence*

Variable	VIF
Experience	1.08
Content	1.13
Length	2.73
Perception	1.89
Self-Efficacy	1.53
Competence	2.11

A path analysis and mediation analysis were conducted for questions 1 and 2 respectively. The following section will address the results of each analysis by question.

*Question 1: What effect does teacher background (such as level of teaching experience, and content area), teacher competency, teacher self-efficacy and teacher perception of assessment skills have on classroom assessment practices in South Central India?*

A path analysis was conducted using the R Package to determine whether the model of regressions accurately described the data. Weighted Least Square Mean and Variance estimation was performed to determine the standard errors for the parameter estimates because assumptions of normality were violated. Two hundred fourteen teachers participated in this study. The sample size is adequate for non-normal data as per the recommendation of Bandalos (2014) and Forero, Maydeu-Olivares, and Gallardo-Pujol (2009). The variables Assessment Training and Education were excluded from the analysis due to absence of variation in the data. Two hundred twelve teachers had a bachelor's degree, one had a master's degree, and one had a Ph. D., all teachers were trained in classroom assessment.

**Model fit.** The model fit the data well based on the following fit indices: chi-square goodness of fit, root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and standardized root mean square residual (SRMR). The fit indices are presented in Table 6.

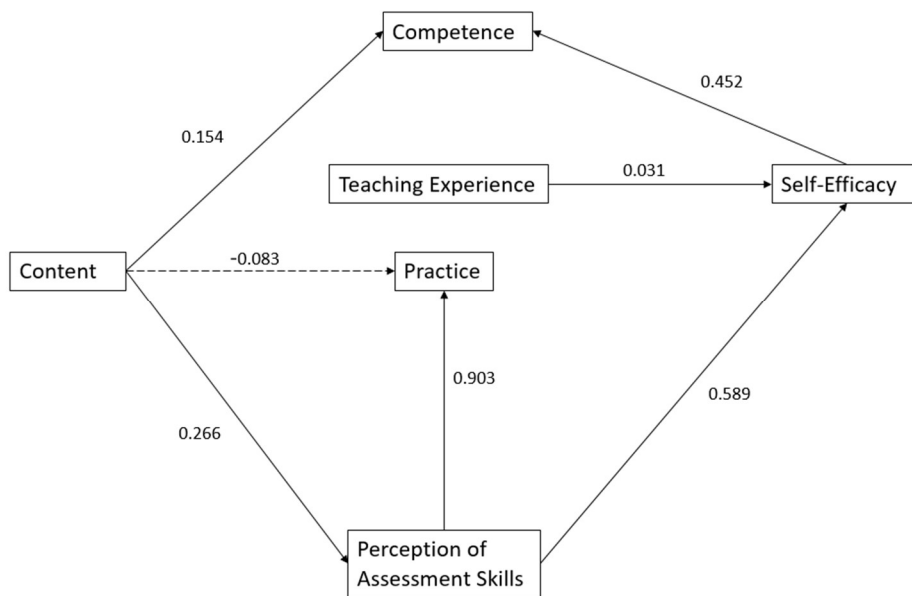
Table 7. *Fit Indices*

$\chi^2$	RMSEA	CFI	TLI	SRMR
0.233	0.044	0.998	0.975	0.021

**Interpretations for regressions.** The regressions were examined based on an alpha value of 0.05. Perception of Skills in classroom assessment significantly predicted teachers' Classroom Assessment Practices,  $\beta = 0.903$ ,  $B=1.038$ ,  $S.E. = 0.056$ ,  $p < .00$ , indicating that an increase in teachers' Perception of Skills will increase their use of objective Classroom Assessment Practices. Years of teachers' experience significantly predicted teachers' Self-Efficacy,  $\beta = 0.134$ ,  $B=0.006$ ,  $S.E. = 0.003$ ,  $p < .006$ , suggesting that as the number of years of teachers' experience increases their level of level of self-efficacy also increases. Teachers' self-efficacy significantly predicted teachers' level of competence in classroom assessment,  $\beta = 0.452$ ,  $B=0.275$ ,  $S.E. = 0.046$ ,  $p < .001$ , suggesting an association between self-efficacy and level of teachers' classroom assessment competence. Teachers' perception of skills in classroom assessment significantly predicted teachers' self-efficacy,  $\beta = 0.589$ ,  $B=0.423$ ,  $S.E. = 0.052$ ,  $p < .001$ , suggesting an association between teachers' perception of skills in classroom assessment and their self-efficacy. Teachers' area of content significantly predicted teachers' Classroom

Assessment Practices,  $\beta = -0.083$ ,  $B = -0.084$ ,  $S.E. = 0.036$ ,  $p < .020$ , suggesting that some content area teachers were less likely to use objective Classroom Assessment Practices than others. There was a significant relationship between teachers' content area and their Perception of Skills in classroom assessment,  $\beta = 0.266$ ,  $B = 0.234$ ,  $S.E. = 0.064$ ,  $p < .001$ , suggesting that some content area teachers perceived themselves to be more skilled in Classroom Assessment than others. There was a significant relationship between teachers' content area and Classroom Assessment Competence,  $\beta = 0.154$ ,  $B = 0.059$ ,  $S.E. = 0.026$ ,  $p < .021$ , suggesting that some content area teachers believe they have higher competency in classroom assessment than others. The path model is presented in figure 3.

Figure 3. Path Model with  $\beta$  Values

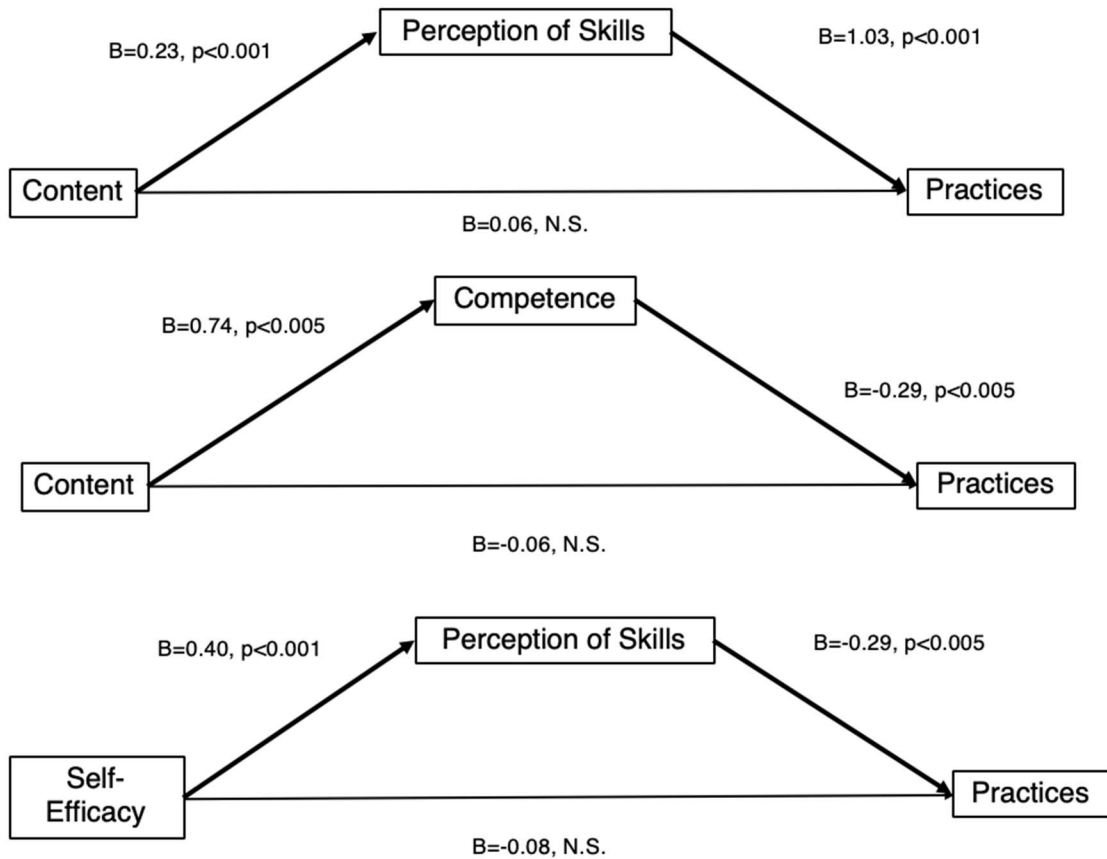


Note. All path coefficients are standardized.

*Question 2: What effect does teacher background (such as level of teaching experience, and content area) have on classroom assessment practices in South Central India mediated by teacher competency and teacher perception of assessment skills?*

**Mediation.** A test of mediation was conducted to determine whether competence, perception of skills, experience, and self-efficacy mediated the relationship between content area and their classroom assessment practices, and teacher experience and their classroom assessment practices. There were no significant mediation effects of any variables on the relationship between teacher experience and teacher classroom assessment practices. There were also no significant mediation effects of experience and self-efficacy on the relationship between teachers' content area and their classroom assessment practices. Teachers' perception of skills significantly mediated the relationship between teachers' content area and their classroom assessment practices,  $B = 0.234$ ,  $S.E. = 0.067$ , 95% CI [0.108, 0.369]. Teachers' perception of skills significantly mediated the relationship between teachers' self-efficacy and their classroom assessment practices,  $B = 0.68$ ,  $S.E. = 0.098$ , 95% CI [0.505, 0.891]. Teachers' competence in classroom assessment significantly mediated the relationship between teachers' content area and their classroom assessment practices,  $B = -0.022$ ,  $S.E. = 0.01$ , 95% CI [-0.045,-0.005]. The mediation models are presented in figure 4.

Figure 4. *Mediation Models*



Note. *Indirect effects reported.  $P < 0.05$*

*Question 3: How do teacher assessment competence, teacher perception of assessment skills, and teacher assessment practices differ based on teacher background?*

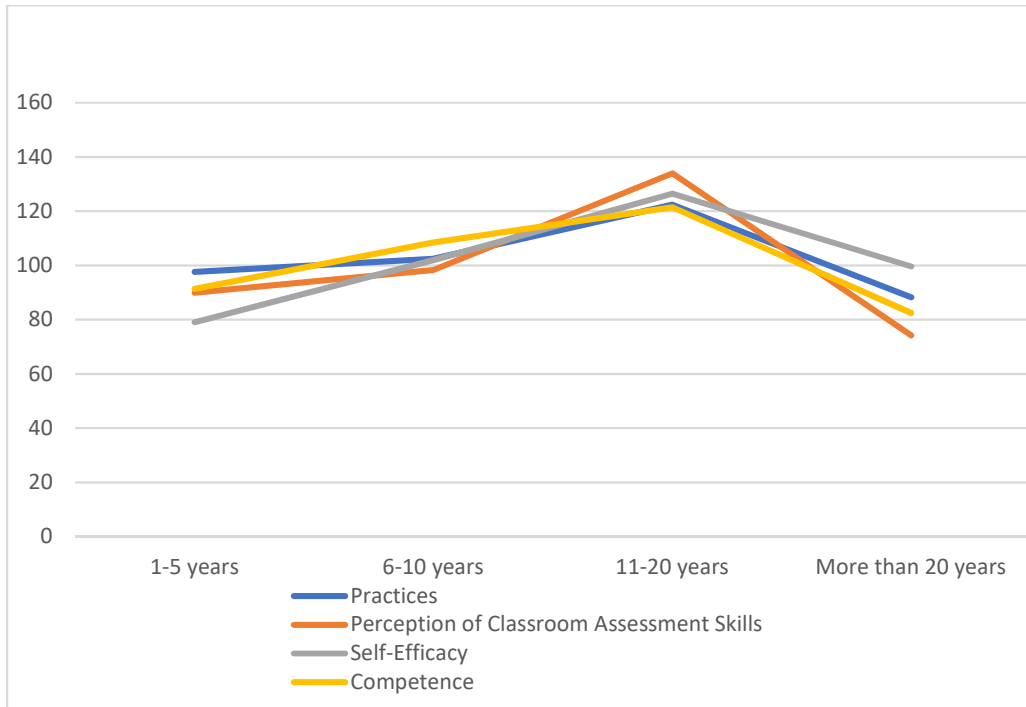
- i. Years of experience*
- ii. Content Area*

**Kruskal-Wallis.** Because assumptions to conduct a MANOVA were violated, Kruskal-Wallis tests were run to investigate group differences instead. Years of experience were grouped into four categories: 1) 0 to 5 years (N=32), 2) 6 to 10 years (N=74), 3) 11 to 20 years (N=81),

and 4) more than 20 years (N=27). Teachers' classroom assessment practices significantly differed based on years of teaching experience,  $H_{(27)} = 53.65, p < 0.05, \eta^2 = 0.24$ . Teachers' perception of assessment skills significantly differed based on years of teaching experience,  $H_{(27)} = 73.57, p < 0.05, \eta^2 = 0.334$ . Teachers' self-efficacy significantly differed based on years of teaching experience,  $H_{(27)} = 59.35, p < 0.05, \eta^2 = 0.267$ . Teachers' competence significantly differed based on years of teaching experience,  $H_{(27)} = 61.98, p < 0.05, \eta^2 = 0.280$ . The effect sizes are fairly small, indicating that although there is statistical significance, the practical significance is low, and the differences are small.

Because the Kruskal-Wallis test is rank-based, mean ranks are an indication of where the differences lie and how much the groups are different. Mean ranks (see Table 7) indicate that, overall, objective use of classroom assessment practices, perception of classroom assessment skills, self-efficacy, and classroom assessment competence increase with teaching experience until the teacher attains 20 years of experience, after which they appear to decline (see Figure 5).

Figure 5. Mean Ranks



A multiple pairwise, all comparisons follow-up analysis was conducted to further investigate the within group differences. While there was an overall effect of experience on classroom assessment practices, there were no significant group differences between the different levels of experience in classroom assessment practices. There were significant differences in perception of classroom assessment skills between teachers with 11-20 years of teaching experience and teachers with more than 20 years of teaching experience,  $z = 4.349$ ,  $p < 0.001$ , indicating that teachers with 11-20 years of experience perceived themselves to be more skillful than teachers with more than 20 years of experience. There were significant differences in perception of classroom assessment skills between teachers with 1-5 years of teaching experience and teachers with 11-20 years of teaching experience,  $z = -3.409$ ,  $p = 0.007$ ,

indicating that teachers with 11-20 years of experience perceived themselves to be more skillful than teachers with 1-5 years of teaching experience. There were significant differences in perception of classroom assessment skills between teachers with 6-10 years of teaching experience and teachers with 11-20 years of teaching experience,  $z = 3.588$ ,  $p = 0.003$  indicating that teachers with 11-20 years of experience perceived themselves to be more skillful than teachers with 6-10 years of teaching experience. There were significant differences in self-efficacy between teachers with 1-5 years and 11-20 years of teaching experience,  $z = -4.044$ ,  $p = 0.001$ , indicating that teachers with 11-20 years of experience have higher self-efficacy than teachers with 1-5 years of teaching experience. There was a significant difference in classroom assessment competence between teachers with 11-20 years of experience and teachers with more than 20 years of experience,  $z = 2.983$ ,  $p = 0.029$  indicating that teachers with 11-20 years of experience greater competency in classroom assessment than teachers with more than 20 years of experience.

Table 8. *Mean Ranks*

	1-5 years	6-10 years	11-20 years	More than 20 years
Practices	97.62	102.49	122.40	88.24
Perception of Classroom Assessment Skills	89.94	98.28	133.97	74.19
Self-Efficacy	79.03	101.92	126.48	99.59
Competence	91.33	108.41	121.42	82.43

Teachers' classroom assessment practices significantly differed based on content area taught,  $H_{(1)} = 8.13$ ,  $p = 0.017$ ,  $\eta^2 = 0.033$ , with more STEM teachers (Mean Rank = 115.03)



using objective assessment practices than non-STEM teachers (Mean Rank = 94.83). Teachers' perception of assessment skills significantly differed based on content area,  $H_{(1)} = 11.174$ ,  $p = 0.001$ ,  $\eta^2 = 0.5$ , with Stem teachers (Mean Rank = 118.53) having a higher perception of their assessment skills than non-STEM teachers (Mean Rank = 88.36). Teachers' classroom assessment competence significantly differed based on content area,  $H_{(1)} = 5.209$ ,  $p = 0.022$ ,  $\eta^2 = 0.02$ , with STEM teachers having greater competency in classroom assessment (Mean Rank = 113.52) compared to non-STEM teachers (Mean Rank = 96.91). Although the findings had statistical significance, the practical significance was low.

## Chapter 5

### Discussion and Implications

This chapter will provide a discussion of results, the implications and significance of the findings, and limitations of the study. Teacher-conducted assessments are necessary to gather important information required in making decisions about students' learning and progress. This necessitates an inquiry into and a compound analysis of the impact of teacher background, assessment competence, teacher self-efficacy, and teacher perception of assessment skills on classroom practices. However, there is a gap in classroom assessment literature and a lack of consistency in teacher knowledge of assessment and assessment practices. This study provides an overview of the importance of classroom assessment for learning and of the development of student assessment in schools in South Central India.

#### Summary of Results

**Self-efficacy.** It was expected that self-efficacy would play a key role in explaining the relationships between classroom assessment practices, teacher assessment competence, teacher perceptions of assessment skills, and teacher background. However, the role of self-efficacy was not as prominent as hypothesized. While this could be because of the limitations in data, it may also be due to the domain specific nature of self-efficacy. That is, because self-efficacy is domain specific, effects that are observed in one domain (e.g., classroom practices) cannot be expected to be observed in other domains (e.g., classroom *assessment* practices). Nonetheless, a few important direct and indirect relationships were observed and are discussed below.

A positive predictive relationship between teacher self-efficacy and teacher classroom assessment competence is consistent to findings in literature (Bandura & Schunk, 1981).

Teachers' with higher self-efficacy are more likely to set higher achievement goals and readily

engage in solving problem compared to teachers with lower self-efficacy. Teachers with higher self-efficacy are also more likely to exhibit persistence in the face of difficulty and focus on mastery of content compared to teachers with lower self-efficacy.

Teachers' self-efficacy significantly predicted teachers' level of competence in classroom assessment. This is because self-efficacy increases performance, interest and effort in tasks, with high self-efficacy leading to high achievement, or in this case, competence (de Laat & Watters, 1995; Schunk & Pajares, 2009); Usher & Pajares). The positive, predictive relationship between teachers' perception of skills in classroom assessment and teachers' self-efficacy is consistent with literature (Gerges, 2001; Gorges & Goke, 2015; Raudenbush et al., 1992). Teachers' self-reflect and evaluate their own behavior and the behavior of others to form beliefs of their own abilities and skills in performing a task, that is, perception of skills, which then influence their self-efficacy (de Laat & Watters, 1995; Eccles & Wigfield, 1995; Wigfield, 1994, Wigfield & Eccles, 2000). Because self-efficacy is the belief in ones' abilities to succeed in a task, it is mediated and influenced by perception of skills, which are beliefs about ones' abilities to perform a task.

**Perception of skills.** Consistent with the findings of Zhang and Burry-Stock (1994; 2003) and Adams and Hsu (1998), perception of skills in classroom assessment are predictive of teachers' classroom assessment practices, suggesting that perception of skills in classroom assessment affects classroom assessment practices of teachers in South Central India similarly to teachers in the USA and in Singapore. Furthermore, this finding is also consistent with the self-efficacy literature. Perception of skills is known within self-efficacy literature as self-concept of ability and is highly correlated with expectancy beliefs (Eccles & Wigfield, 1995; Wigfield, 1994, Wigfield & Eccles, 2000). That is, perception of one's own skills in performing a task is

highly correlated with the belief that one's effort will result in the attainment of one's performance goals. Thus, the positive relationship between teachers' perception of skills in classroom assessment and teachers' classroom assessment practices implies that teachers with positive perception of skills in classroom assessment are more likely to engage in objective classroom assessment practices because they believe that their effort will result in successful completion of classroom assessment.

**Content Area.** The negative relationship between content area teachers and their use of objective classroom assessment practices was contrary to the findings of Zhang and Burry-Stock (2003), Adams and Hsu (1998) and Alkharusi et al. (2012). Furthermore, the results of the current study reveal that STEM teachers are more likely to use objective classroom assessment practices than non-STEM teachers. This, too, is contrary to the findings of Zhang and Burry-Stock (2003). They found that STEM teachers graded on non-achievement-related factors, such as motivation and effort, more frequently than non-STEM teachers, and suggested that this could be due to teachers' beliefs that motivation and effort have an impact on achievement. The difference in the findings could be a result of the nature of the subjects. Perhaps teachers in the USA, Singapore, and Oman are more similar to each other than teachers in South Central India. It is difficult to determine this with certainty because the classroom assessment knowledge and practices of teachers in India have not previously been studied. The findings of this study may be true only for this particular group of teachers.

The relationship between teachers' content area and their perception of skills in classroom assessment is harder to explain. STEM teachers appeared to be more likely to perceive themselves as being highly skilled in classroom assessment compared to non-STEM teachers. STEM teachers (Mean = 0.5) were found to have greater competency in classroom assessment

compared to non-STEM teachers (Mean = 0.3). This might be because of the objective nature of STEM subjects, which are usually more straightforward and have a single right answer. Conversely, non-STEM subjects tend to have the potential to be more subjective and open-ended.

The teachers in two states in South Central India that participated in the present study scored an average of 47% on the competence part of the questionnaire, indicating that they may not have high knowledge of classroom assessment. The questions were adapted from a questionnaire developed for use in the USA. Care was taken to adapt it to the cultural and educational context of India. However, the language of the survey and the terms used may have been lost in translation, because of the differences in operational definitions in the educational system in the USA and in India. Teachers' content area was also predictive of their classroom assessment competence, consistent with the findings of Alkharusi et al. (2012), with STEM teachers having a higher competence in classroom assessment than non-STEM teachers. There is no explanation given in current literature as to why this may be. However, this might be due to the objective nature of STEM subjects. This observation is not unique to South Central India, but is consistent with studies from the USA, Oman, and Singapore.

**Years of experience.** Years of teachers' experience had a positive predictive relationship on teachers' Self-Efficacy, with the number of years of teachers' experience (until 20 years) increasing their level of level of self-efficacy. This is contrary to the findings in literature (Pajares & Graham, 1999; Woolfolk et al., 2005), where self-efficacy declined over time. Woolfolk et al. found that novice teachers' decline in self-efficacy was correlated with the perceived support in the school environment. If this is a generalizable explanation, teachers' in South Central India might have a higher perception of support in the school environment.

Burnout was not considered in this study, but might have been a contributing factor to the decline in self-efficacy beyond the 20 year mark.

Objective classroom assessment practices, perception of classroom assessment skills, self-efficacy, and classroom assessment competence increase in the first 20 years of teaching because teachers gain more knowledge and comfort in classroom assessment as their years of teaching experience increases. However, the decline across these variables after 20 years of teaching could be explained by a decline in long-term teachers' self-efficacy. The decline in self-efficacy could be a result of teachers in South Central India feeling that their classroom assessment knowledge is obsolete, because they have not received professional development, training beyond what they learned in college or as part of their on-boarding as a teacher. As their self-efficacy declines, so does their classroom assessment competence, as found through the path analysis above. The decline in teachers' classroom assessment competence could also be explained by a lack of consistent, relevant training or professional development. While self-efficacy was not found to have a direct relationship with classroom assessment practices or perception of assessment skills, there is a moderately strong correlation between the two ( $r = 0.516$ ) indicating that as perception of skills declines, so does teachers' use of objective classroom assessment practices.

### **Scientific and scholarly significance**

The significance of this study is twofold. Firstly, it is the only study, to the author's knowledge, on classroom assessment that is guided by a theoretical framework. This is important because a theoretical framework provides a context to understanding phenomenon in a meaningful way. The theoretical framework used in this study is self-efficacy, an important construct that is related to perception of skills, practices, and performance. Therefore, this study

attempted to provide meaningful explanations to the relationships found between the examined variables, and in doing so, hoped to add value to scholarly literature. Secondly, this is the first study to examine classroom assessment competence, practices, teachers' perceptions of their classroom assessment skills, and teachers' self-efficacy in South Central India. India is a vastly diverse country with differences in languages, culture, and religion across states and regions. This makes India interesting to study. Furthermore, the curriculum for the entire country is standard, set by the government of India. Private schools and public schools all teach a common curriculum to their students, and all students across take the same standardized tests. From a research perspective, India is valuable because it is a large diverse country (multiple dependent variables) with a common curriculum (independent variable) (Chhokar, 2013). Because there is limited information on classroom assessment practices and their effects on students' learning in India, necessary from a practical point of view as well.

### **Limitations and Further Research**

Due to the limitations in the data collected, important variables like training and education, were left out of the path model. The question of whether teachers who were more prone to using objective assessment measures were the ones who received training in measurement or had a higher perception of assessment skills was left unanswered. This question has been neglected in prior research as well and should be considered in future research. Because all the teachers in South Central India have at least a bachelor's degree and are trained in assessment as part of their degree curriculum, conducting a comparative study of pre-service teachers and in-service teachers in South Central India might provide the necessary data to answer the question of whether training in assessment encourages the use of objective classroom assessment measures, and affects perception of assessment skills.

Furthermore, the use of instruments developed to assess US teachers' competence in, and perceptions of classroom assessment might not have been ideal to studying teachers in South Central India. This reduced the return rate of completed surveys. Nonetheless, it was appropriate for this study, due to its exploratory nature, and a scarcity of existing studies. However, it might be advisable to develop an instrument solely based on the Indian context to better understand teachers' competence in, and perceptions of, classroom assessment in South Central India, and their needs to improve their skills. An approach to this would be to follow up the present study with a round of interviews of the teachers, observations of their classroom assessment practices, and a content analysis of assessment training documents used in India. Tailoring an instrument to the cultural and educational context of India would not only result in better data but might also encourage more teachers in participate in future studies.

In addition, because the data was not normally distributed, and more conservative non-parametric analyses were used, power, and as a result, statistical significance and generalizability of findings, are reduced. In addition, because a univariate non-parametric analysis was run, instead of a multivariate analysis as planned, any interaction between the factors were not included in the analysis. This issue might be resolved with a larger sample size. Allowing for more time to collect data, using a more culturally appropriate instrument, and having a larger team to collect data from a wider geographical range might address the limitations of this study.



## Appendix A Teacher Background

1. What is the highest degree you have earned?
  - a. Intermediate
  - b. Polytechnic
  - c. Bachelors (BSc/BA/BEd)
  - d. Masters (MSc/MA/MEd)
  - e. PhD/EdD
  
2. Select the state you teach in
  - a. List of States
  
3. Which standard do you teach? Select all that apply.
  - a. 6
  - b. 7
  - c. 8
  - d. 9
  - e. 10
  - f. 11
  - g. 12

4. How many years of teaching experience do you have?
5. What subjects do you teach
6. Do you teach in English Medium?
  - a. Yes
  - b. No
7. Have you received training in classroom assessment? If so, when (e.g. in bachelors, while working as a teacher, etc.)?
  - a. In Bachelors
  - b. In Masters
  - c. After joining as a teacher
  - d. I have not received training in classroom assessment
8. Please describe your assessment training.
9. How many years of assessment training have you received?

## Appendix B Teacher Competence Questions

- 1) What is the most important consideration in choosing a method for assessing student achievement?
  - a. Ease of scoring assessment
  - b. Ease of preparing the method of assessment
  - c. Accuracy of assessing attainment of instructional objectives
  - d. Acceptance by the school administration
  
- 2) When scores from a standardized test are said to be reliable, what does it imply?
  - a. Student scores from the test can be used for a large number of educational decisions
  - b. If a student retook the same test, the student would get a similar score on each retake
  - c. The test score is a more valid measure than teacher judgments
  - d. The test score accurately reflects the content of instruction in the classes where the test is administered

- 3) A teacher wants to assess her students' understanding of a subject she has taught. Which assessment strategy would be most valid?
- Select a textbook that has a 'teacher's guide' with a test developed by the authors
  - Develop an assessment consistent with an outline of what she has actually taught in class
  - Select a standardized test that provides a score on problem solving skills
  - Select an instrument that measures students' attitudes about problem solving strategies
- 4) How can a teacher use an assessment method that requires students to show their work (for example, the steps used in solving a maths question)?
- Assigning marks
  - Providing instructional feedback to students
  - Motivating students to try different methods to solve questions
  - None of the above

- 5) How can a teacher know if students are learning higher order thinking skills (such as problem solving, and not just memorizing)?
- By looking at lesson plans for the subject
  - Looking at the state curriculum guides for that subject
  - Looking at copies of the class unit tests or assessment strategies used to assign marks
  - Worksheets completed by the students
- 6) A teacher wants to document the validity of the marks from a classroom assessment strategy she plans to use for assigning grades on a class unit. What kind of information would be best for this?
- Ask other teachers whether the assignment strategy covers what was taught
  - Match an outline of the instructional content to the content of the assessment strategy
  - Ask students if they think the assessment is valid
  - Ask parents if the assessment reflects important learning outcomes

- 7) Which of the following actions would increase the reliability of a teacher's multiple choice end of unit examination in physical science?
- Use a blueprint to develop the test questions
  - Change the test format to true-false questions
  - Add more items like those already in the test
  - Add an essay component
- 8) Several students got low marks in a multi-step problem-solving test in mathematics. The teacher wants to know who all are having the same problem so she can put them into groups and help them based on their problem. Which assessment strategy would be best for her to group students?
- Use the test provided in the 'teacher's guide'
  - Give the students a test that has separate items for each step of the process
  - Look at the students' records and standardized test scores to see which topics the students had not performed well on before
  - Give students multi-step problems to complete and make them show their work

- 9) Many teachers score classroom tests using a 100-point percentage scale. In general, what does a student's score of 90 on that scale mean?
- The student answered 90% of the items on the test correctly
  - The student knows 90% of the instructional content of the unit covered by the test
  - The student scored higher than 90% of all the students who took the test
  - The student scored 90% higher than the average student in the class
- 10) Students in Mr.Raj's science class are required to develop a model of the solar system as part of their end of unit grade. Which scoring procedure below will maximize the objectivity of assessing thee student projects?
- When the models are turned in, Mr. Raj identifies the most attractive models and gives them the highest grade.
  - Mr. Raj asks other teachers in the school to rank the projects
  - Mr. Raj uses a scoring key created by the highest performing students in class
  - Mr. Raj prepares a scoring rubric and assigns weights to critical features. Students with the highest score gets the highest marks

11) Students in a class were given a social studies test that was modeled after a standardized test. 2 students in the class who normally perform well scored lower on the test than other students. Which information would be most helpful in understanding why this happened?

- a. The gender of the students
- b. The age of the students
- c. Reliability data for the standardized social studies test she used as a model
- d. Reading comprehension scores for the students

12) When the directions indicate each section of a standardized test is timed separately, which of the following is acceptable test taking-behaviour?

- a. A student finishes section 1 early and checks his answers in that section
- b. A student finishes section 2 early and rechecks answers in section 1
- c. A student finishes section 1 early, and looks at the section 2 questions but does not answer them
- d. A student does not finish section 1 and uses all the time to work on that section

13) Mrs Mehta is starting a new semester with a factoring unit in her Algebra 1 class. Before beginning the unit, she gives her students a test on the communicative, associative, and



distributive properties of addition and multiplication. Which of the following is the most likely reason she gives this test to her students?

- a. The principal needs to report the results of this assessment to the state testing director
- b. Mrs Mehta wants to give the students practice in taking tests early in the semester
- c. Mrs Mehta wants to check for prerequisite knowledge in her students before she begins the unit on factoring
- d. Mrs Mehta wants to measure growth in student achievement of these concepts, and scores on this test will serve as the students' knowledge baseline

14) To evaluate the effectiveness of the mathematics program for her gifted students in 1st standard, Mrs Bala gave them a standardized maths test normed on 3rd standard students. To decide how well her students performed, Mrs Bala compared her students' scores to those of the third standard norm group. Why is this an incorrect application of standardized test norms?

- a. The norms are not reliable for first standard students
- b. The norms are not valid for first standard students
- c. Third standard mathematics items are too difficult for first standard students
- d. The time limits are too short for first standard students

15) When planning classroom instruction for a unit on arithmetic operations with fractions, which of these types of information have more potential to be helpful?

Norm-referenced information: Describes each student's performance relative to other students in a group (e.g. percentile ranks, stanines)

Criterion-referenced information: describes each student's performance in terms of status on specific learning outcomes (e.g. number of items correctly answered for each specific objective)

- a. Norm-referenced information
- b. Criterion referenced information
- c. Both types are equally useful in helping to plan for instruction
- d. Both are not useful in helping to plan for instruction

16) Students' scores on standardized tests are sometimes inconsistent with their performances on classroom assessments, e.g. teacher tests or other in-class activities. Which of the following is NOT a reasonable explanation for such discrepancies?

- a. Some students freeze up on standardized tests, but they do fine in classroom assessments
- b. Students often take standardized tests less seriously than they take classroom assessments
- c. Standardized tests measure only recall of information while classroom assessments measure more complex thinking
- d. Standardized tests may have less curriculum validity than classroom assessments

17) Of the following, which choice typical provides the most reliable student-performance information a teacher might consider when assigning a unit grade?

- a. Scores from a teacher-made test containing two or three essay questions related directly to instructional objectives of the unit
- b. Scores from a teacher-made 20 item multiple choice test designed to measure the specific instructional objectives of the unit
- c. Oral responses to questions asked in class of each student over the course of the unit
- d. Daily grades designed to indicate the quality of in-class participation during regular instruction

18) A teacher gave three tests during a grading period and she wants to weight them all equally when assigning grades. The goal of the grading program is to rank order students on achievement. In order to achieve this goal, which of the following should be closest to equal?

- a. Number of items
- b. Number of students taking each test
- c. Average scores
- d. Variation (range) of scores

19) When a parent asks a teacher to explain the basis for his or her child's grade, the teacher should:

- a. Explain that the grades are assigned fairly, based on the student's performance and other related factors
- b. Ask the parents what they think should be the basis for the child's grade
- c. Explain exactly how the grade was determined and show the parent samples of the student's work
- d. Indicate that the grading scale is imposed by the school board and the teachers have no control over the grades

20) Which of the following grading practices results in a grade that least reflects students' achievement?

- a. It is compulsory to submit homework, but only odd number of questions of students' homework are marked
- b. Weekly quizzes and 3 major exams to assign final grade in class
- c. Allowing students to re-do homework to improve their marks
- d. Deducting 5 points from students' exam marks for bad behaviour

21) In a routine conference with Priya's parents, Mrs. Bose observed that Priya's scores on the state assessment program's quantitative reasoning tests indicate Priya is performing better in mathematics concepts than in mathematics computation. This probably means that:

- a. Priya's score on the computation test was below average.
- b. Priya is an excellent student in mathematics concepts.
- c. The percentile bands for mathematics concepts and computation tests do no overlap.
- d. The mathematics concepts test is a more valid measure of Priya's quantitative reasoning ability.

22) Which statement helps to explain differences in test scores across school systems?

- a. The number of students in each school system
- b. The average socio-economic status of the school systems
- c. The ethnic distribution of students in each school system
- d. The drop-out rate in each school system

23) Mr Singh gives his students grades based on homework and tests. Mr Dev gives his students grades based on his observation of the students in class. This is a difference in:

- a. Formal and informal assessment
- b. Performance and applied assessment
- c. Customized and tailored assessment
- d. Formative and summative assessment

24) John scored at the 60th percentile on a maths test and in the 57th percentile on an English test. If the percentile bands for each test are five percentile ranks wide, what should John's teacher do with these results?

- a. Ignore this difference
- b. Provide John with individual help in English
- c. Motivate John to practice English more outside of school
- d. Provide enrichment experiences for John in maths

25) For each item, please use the following rating scales to indicate (1) how frequently you use the assessment practice described by the item and (2) how skilled you are in using that assessment practice.

## **Appendix C**

### **Teacher Perceptions and Practices Questions**

1. Choosing appropriate assessment methods for instructional decisions.
2. Selecting textbook-provided test items for classroom assessment.
3. Revising previously produced teacher-made tests to match current instructional emphasis.
4. Administering announced quizzes.
5. Administering unannounced quizzes.
6. Evaluating oral questions from students.
7. Assessing students through observation.
8. Determining if a standardized achievement test is valid for classroom assessment.
9. Using a table of specifications to plan assessments.
10. Developing assessments based on clearly defined course objectives.
11. Matching assessments with instruction.
12. Writing paper-pencil tests.
13. Writing multiple-choice questions.
14. Writing matching questions.
15. Writing true/false questions.
16. Writing fill-in-the-blank or short answer questions.
17. Writing essay questions.
18. Writing test items for higher cognitive levels.
19. Constructing a model answer for scoring essay questions.
20. Ensuring adequate content sampling for a test.
21. Matching performance tasks to instruction and course objectives.

22. Defining a rating scale for performance criteria in advance.
23. Communicating performance assessment criteria to students in advance.
24. Recording assessment result on the rating scale/checklist while observing a student's performance.
25. Using concept mapping to assess student learning.
26. Assessing individual class participation.
27. Assessing group class participation.
28. Assessing individual hands-on activities.
29. Assessing group hands-on activities.
30. Assessing individual class participation.
31. Using portfolios to assess student progress.
32. Following required procedures (time limit, no hints, no interpretation) when administering standardized tests.
33. Interpreting standardized test scores (e.g., Stanine, Percentile Rank) to students and parents.
34. Interpreting Percentile Band to students and parents.
35. Calculating and interpreting central tendency and variability for teacher-made tests.
36. Conducting item analysis (i.e., difficulty and discrimination indices) for teacher-made tests.
37. Revising a test based on item analysis.
38. Obtaining diagnostic information from standardized tests.
39. Using assessment results when planning teaching.
40. Using assessment results when developing curriculum.
41. Using assessment results when making decisions (e.g., placement, promotion) about individual students.



42. Using assessment results when evaluating class improvement.
43. Using assessment results when evaluating school improvement.
44. Developing systematic grading procedures.
45. Developing a grading philosophy.
46. Using norm-referenced grading model.
47. Using criteria-referenced grading model.
48. Using systematic procedures to determine borderline grades.
49. Informing students in advance how grades are to be assigned.
50. Establishing student expectations for determining grades for special education students.
51. Weighing differently projects, exams, homework, etc. when assigning semester grades.
52. Incorporating extra credit activities in the calculation of grades.
53. Incorporating ability in the calculation of grades.
54. Incorporating classroom behavior in the calculation of grades.
55. Incorporating improvement in the calculation of grades.
56. Incorporating effort in the calculation of grades.
57. Incorporating attendance in the calculation of grades.
58. Assigning grades.
59. Providing oral feedback to students.
60. Providing written feedback to students.
61. Communicating classroom assessment results to students.
62. Communicating classroom assessment results to parents.
63. Communicating classroom assessment results to other educators.
64. Avoiding teaching to the test when preparing students for tests.

65. Protecting students' confidentiality with regard to test scores.

66. Recognizing unethical, illegal, or otherwise inappropriate assessment methods.

## **Appendix D**

### **Teacher Self-Efficacy Questions**

For the following items, please indicate if the statement is (1) not at all true, (2) barely true, (3) moderately true, (4) exactly true.

1. I am convinced that I am able to successfully teach all relevant subject content to even the most difficult students.
2. I know that I can maintain a positive relationship with parents even when tensions arise.
3. When I try really hard, I am able to reach even the most difficult students.
4. I am convinced that, as time goes by, I will continue to become more and more capable of helping to address my students' needs.
5. Even if I get disrupted while teaching, I am confident that I can maintain my composure and continue to teach well.
6. I am confident in my ability to be responsive to my students' needs even if I am having a bad day.
7. If I try hard enough, I know that I can exert a positive influence on both the personal and academic development of my students.
8. I am convinced that I can develop creative ways to cope with system constraints (such as budget cuts and other administrative problem and continue to teach well.
9. I know that I can motivate my students to participate in innovative projects.
10. I know that I can carry out innovative projects even when I am opposed by skeptical colleagues.

## References

- Adams, T. L., & Hsu, J. W. Y. (1998). Classroom assessment: Teachers' conceptions and practices in mathematics. *School Science and Mathematics, 98*(4), 174-180.
- Alkharusi, H. A. (2009). Correlates of Teacher Education Students' Academic Performance in an Educational Measurement Course. *International Journal of Learning, 16*(2).
- Alkharusi, H. (2010). A multilevel linear model of teachers' assessment practices and students' perceptions of the classroom assessment environment. *Procedia-Social and Behavioral Sciences, 5*, 5-11.
- Alkharusi, H., Aldhafri, S., Alnabhani, H., & Alkalbani, M. (2012). Educational assessment attitudes, competence, knowledge, and practices: An exploratory study of Muscat teachers in the Sultanate of Oman. *Journal of Education and Learning, 1*(2), 217.
- Araceli Ruiz-Primo, M., & Furtak, E. M. (2006). Informal formative assessment and scientific inquiry: Exploring teachers' practices and student learning. *Educational Assessment, 11*(3-4), 237-263.
- Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of personality and social psychology, 41*(3), 586.
- Barksdale-Ladd, M. A., & Thomas, K. (2000). What's at stake in high stakes testing: Teachers and parents speak out. *Journal of Teacher Education 51*, 384-97.
- Bol, L., Stephenson, P. L., O'connell, A. A., & Nunnery, J. A. (1998). Influence of experience, grade level, and subject area on teachers' assessment practices. *The Journal of Educational Research, 91*(6), 323-330.

Campbell, C., & Evans, J. A. (2000). Investigation of preservice teachers' classroom assessment practices during student teaching. *The Journal of Educational Research*, 93(6), 350-355.

Chhokar, J. S. (2013). India: Diversity and complexity in action. In *Culture and leadership across the world* (pp. 1005-1054). Routledge.

CII. (2013). Towards Professional Preparation of the Teacher Educators (pp. 5-71, Rep.). Confederation of Indian Industry (CII).

Cizek, G.J., Fitzgerald, Shawn M., & Rachor, R.E. (1996). Teachers' assessment practices: Preparation, isolation and the kitchen sink. *Educational Assessment*, 3(2), 159- 179.

Daniel, L., G., & King, D., A. (1998). Knowledge and use of testing and measurement literacy of elementary and secondary teachers. *Journal of Educational Research*, 331-344.

Earl, L. M. (2013). Assessment for learning; Assessment as learning: Changing practices means changing beliefs. *Assessment*, 80, 63-71.

Elango, S. R. J. L. L., Jutti, R. C., & Lee, L. K. (2005). Portfolio as a learning tool: Students' perspective. *ANNALS-ACADEMY OF MEDICINE SINGAPORE*, 34(8), 511.

Frary, R. B., Cross, L. H., & Weber, L. J. (1993). Testing and grading practices and opinions of secondary teachers of academic subjects: Implications for instruction in measurement. *Educational Measurement: Issues and Practice*, 12(3), 23-30.

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

Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). Educational research: Competencies for analysis and applications. Boston: Pearson.

Gullikson, A. R. (1984). Teacher perspectives of their instructional use of tests. *Journal of Educational Research*, 77(4), 244-248.

- Griswold, P. A. (1993). Beliefs and influences about grading elicited from student performance sketches. *Educational Assessment, 1*(4), 311-328.
- Hall, J. L., & Kleine, P. F. (1992). Educators' perceptions of NRT misuse. *Educational measurement: Issues and practice, 11*(2), 18-22.
- Haladyna, T. M., Downing, S. M., & Rodriguez, M. C. (2002). A review of multiple-choice item-writing guidelines for classroom assessment. *Applied measurement in education, 15*(3), 309-333.
- Hills, J. R. (1991). Apathy concerning grading and testing. *Phi Delta Kappan, 72*(7), 540-45.
- Impara, J. C., Divine, K. P., Bruce, F. A., Liverman, M. R., & Gay, A. (1991). Teachers' ability to interpret standardized test scores. *Educational Measurement: Issues and Practice, 10*(4), 16-18.
- Jongsma, K. S. (1991). Rethinking Grading Practices (Research to Practice). *Reading Teacher, 45*(4), 318-20.
- Kane, M. B., Khattri, N., Reeve, A. L., & Adamson, R. J. (1997). Assessment of student performance. *Washington, DC: Studies of Education Reform, Office of Educational Research and Improvement, US Department of Education.*
- Kapur, K. (2008). Assessment for Improving Learning in Schools in India : A perspective. Unpublished manuscript, NCERT.
- Kleinert, H. L., Kennedy, S., & Kearns, J. F. (1999). The impact of alternate assessments: A statewide teacher survey. *The Journal of Special Education, 33*(2), 93-102.
- Koh, K., & Luke, A. (2009). Authentic and conventional assessment in Singapore schools: An empirical study of teacher assignments and student work. *Assessment in Education: Principles, Policy & Practice, 16*(3), 291-318.

- Madaus, G. F. (1988). The distortion of teaching and testing: High-stakes testing and instruction. *Peabody Journal of Education*, 65(3), 29-46.
- Marzano, R. J. (2006). *Classroom assessment & grading that work*. ASCD.
- McMillan, J. M. (2008). *Assessment essentials for student-based education* (2nd ed.). Thousand Oaks: Crown Press.
- Mertler, C. A. (2003). Preservice Versus Inservice Teachers' Assessment Literacy: Does Classroom Experience Make a Difference?.
- Mertler, C. A., & Campbell, C. (2005). Measuring Teachers' Knowledge & Application of Classroom Assessment Concepts: Development of the " Assessment Literacy Inventory". *Online Submission*.
- Miller, M. D., Linn, R. L. & Gronlund, N. E. (2008). *Measurement and assessment in teaching*. 10th edition. New Jersey: Pearson Education, Inc., pp. 1–287.
- Nenty, H. J., Adedoyin, O. O., Odili, J. N., & Major, T. E. (2007). Primary teachers' perceptions of classroom assessment practices as means of providing quality primary and basic education by Botswana and Nigeria . *Educational Research and Review*, 2, 74-81.
- Nichols, S. L., & Berliner, D. C. (2007). *Collateral damage: How high-stakes testing corrupts America's schools*. Harvard Education Press.
- Nolen, S. B., Haladyna, T. M., & Haas, N. S. (1992). Uses and abuses of achievement test scores. *Educational Measurement: Issues and Practice*, 11(2), 9-15.
- Ohlsen, M., T. (2007). Classroom assessment practices of secondary school members of NCTM. *American Secondary Education*, 36 , 4-14.

- O'Sullivan, R. G., & Chalnack, M. K. (1991). Measurement-Related Course Work Requirements for Teacher Certification and Recertification. *Educational Measurement: Issues and Practice*, 10(1), 17-19.
- Panizzon, D., & Pegg, J. (2007). Chasms in student achievement: Exploring the rural-metropolitan divide. *Education in Rural Australia*, 17(2), 3.
- Plake, B. S. (1993). Teacher assessment literacy: Teachers' competencies in the educational assessment of students. *Mid-Western Educational Researcher*, 6(1), 21-27.
- Plake, B. S., & Impara, J. C. (1992). Teacher competencies questionnaire description. *Lincoln, NE: University of Nebraska*, 312.
- Plake, B. S., Impara, J. C., & Fager, J. J. (1993). Assessment competencies of teachers: A national survey. *Educational Measurement: Issues and Practice*, 12(4), 10-12.
- Phye, G. D. (1997). Handbook of classroom assessment: Learning, adjustment, and achievement. *Academic Press Inc. success: a case study. Progressio South African Journal for Open and Distance Learning Practice*, 33(1), 43-58.
- Reynolds, C., R., Livingston, R. B., & Willson, V. (2009). Measurement and assessment in education (2nd. ed.). Ohio: Pearson.
- Rowantree, D. (1987). New Jersey. Assessing students: How shall we know them ? Library of Congress Cataloging-in-Publication Data.
- Shulman, L. S. (1980). Test design: A view from practice. In E. L. Baker and E. S. Quellmalz, (Eds.), *Educational testing and evaluation*. Los Angeles: Sage.
- Standards for educational and psychological testing. (1990). Washington, DC: American Educational Research Association.
- Stiggins, R. J. (1991). Assessment literacy. *Phi Delta Kappan*, 72(7), 534-39.



- Stiggins, R. J., & Conklin, N. F. (1992). *In teachers' hands: Investigating the practices of classroom assessment*. SUNY Press.
- Stiggins, R., & Chappuis, J. (2005). Using student-involved classroom assessment to close achievement gaps. *Theory into practice, 44*(1), 11-18.
- Struyven, K., Dochy, F., & Janssens, S. (2005, August 1). Students' Perceptions about Evaluation and Assessment in Higher Education: A Review. *Assessment and Evaluation in Higher Education, 30*(4), 325-341.
- Tabachnick, B. G., & Fidell, L. F. (2007). *Using multivariate statistics* (5th . ed.). Boston: Pearson Education, Inc.
- Venkatachalam, K. S. (2017, January 25). Why Does India Refuse to Participate in Global Education Rankings? The Diplomat. Retrieved from <https://thediplomat.com/2017/01/why-does-india-refuse-to-participate-in-global-education-rankings>
- Waldrip, B. G., Fishers, D. L., & Doman, J. (2009). Identifying exemplary science teachers through their students' perceptions of the assessment process.
- Zhang, Z. R., & Burry-Stock, J. A. (2003). Classroom assessment practices and teachers 'self-perceived assessment skills. *Applied Measurement in Education, 16*, 323-342.

## Curriculum Vitae

### Manognya Murukutla

Email: [manognya.m@gmail.com](mailto:manognya.m@gmail.com)

### Education

Doctor of Philosophy, Educational Psychology, Dec 2019  
University of Nevada, Las Vegas

Master of Hospitality Administration, June 2010  
University of Nevada, Las Vegas

Bachelor of Science, Business Administration, June 2008  
University at Buffalo, The State University of New York

### Selected Publications & Conference Proceedings

- Huerta, M., Garza, T., Jackson, J. K., & Murukutla, M. (2018). Science teacher attitudes towards English learners. *Teaching and Teacher Education*.
- Murukutla, M., Calkins, C. M., & Bernacki, M. L. (under review). A Mixed Methods Examination of Social and Cognitive Reflective Writing Interventions and Induction of Motivational Change. *Motivation and Emotion*.
- Xi Yu, Manognya Murukutla & Mehmet Erdem, "The World of Social Media: Implications for Hospitality Research", *Encyclopedia of Information Science and Technology*, 2014.
- Manognya Murukutla & Brett Campbell, "Creating Support for Action Research in the Classroom", AERA, San Francisco, California, April 2013.
- Manognya Murukutla, Celeste Calkins & Matthew Bernacki, "Are there benefits to combining social and cognitive writing interventions?: A mixed methods investigation", AERA, San Antonio, Texas, April 2017
- Manognya Murukutla & Alice Corkill, "The Relationship Between Working Memory Span and Self-Regulated Learning", HICE, Honolulu, Hawaii, January 2016
- Manognya Murukutla, "Parent Involvement: It's Not What You Think It Is (Case Study)", EQRC, Las Vegas, Nevada, February 2015
- Li Dan & Manognya Murukutla, "Relationship between Parental Reading Belief, Parental Involvement, Children's Motivation and Reading Achievement: A Study of Chinese Students at Fourth Grade based on data from PIRLS 2011", AERA, Philadelphia, Pennsylvania, April 2014

### Work History

**Director of Institutional Research and Assessment**

Touro University Nevada

Present

- Responsible for the collection, analysis, and reporting of data for institutional outcomes

- assessment, institutional decision making, and data reporting requirements
- Coordinate the development, collection, and maintenance of an integrated institutional data set
  - Coordinate external data reporting
  - Coordinate the development of comparative and annual reports of institutional data
  - Assist college committees, academic departments, and administrative offices with data requests
- Provide leadership for institutional outcomes assessment activities for the University
  - Provide support for localized survey research, program review and strategic planning
- Design and conduct studies to address critical issues of institutional concern
- Support with data and analysis decision making at all levels
- Design and provide training for entire university on data warehousing, survey software and survey best practices

### **Graduate Assistant**

University of Nevada, Las Vegas

2010-2018

- Led course curriculum design and support, providing course outcomes and learning objectives.
- Prepared and taught a variety of courses to a diverse group of adult learners in both online and in-person formats.
- Developed creative and engaging course curriculum in accordance with learning theory, instructional design models, and industry best practices.
- Developed and administered quantitative and qualitative assessments to monitor and evaluate instruction effectiveness and provide detailed reports of the findings.
- Developed training protocol and reviewed them for effectiveness and psychometric validity
- Coordinated guest speakers, managed logistical arrangements, and created schedules for training workshops
- Collaborated with partners and stakeholders design and implement quality training and ensure audience engagement.
- Facilitated a year-long action research workshop for teachers in CCSD.
- Conducted research to develop online curriculum for training of hourly paid hotel employees for William F. Harrah Hotel College.
- Led a research team of students and professors in Motivation research, data organization and analysis, producing a final write-up of results manuscript for dissemination to a broad audience of both experts and novices.

### **Research Assistant**

Iowa State University

2012-2013

- Coordinated large-scale data collection initiatives for various research projects, including providing logistic support for connecting key stakeholders and making facility arrangements for focus groups sessions.

- Trained scientists and graduate students in multiple research software and eye-tracking machine
- Designed evaluation protocol and materials, surveys and interview/focus group protocol for Iowa-Advanced Manufacturing (I-AM) Evaluation for the Iowa departments of Labor and Education and the Iowa Reading Research Center.
- Collected quantitative and qualitative data from relevant partners and stakeholders in Iowa and analyzed large amounts of data.
- Collaborated in the Iowa Reading First initiative by the Iowa Department of Education to increase reading proficiency of all children in Iowa through designing and distributing surveys.
- Designed interview protocol and conducted interviews of all teachers and participating parents in Iowa.
- Designed and conducted experiments for research on memory and self-regulation of learning, including the collection of data and subsequent quantitative analysis.

### **Marketing Intern**

Holiday Inn, Singapore

2009-2010

- Trained and led a team of hourly-paid employees in an immersive and interactive marketing initiative.
- Trained and led a team of management trainees in communications with International Hotels Group corporate office and collaborated with other stakeholders to ensure efficiency of rebranding efforts.
- Facilitated rebranding efforts through conducting marketing campaigns, press releases, and advertisement design generating more than S\$340,000 worth of PR value.
- Designed and distributed surveys for market research.
- Assisted the human resources department in facilitating trainings.
- Trained in Intercontinental Hotels Group guest services best practices.