Understanding The Constructivist Learning Environment In Teacher Education Methods Courses

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UNDERSTANDING THE CONSTRUCTIVIST LEARNING ENVIRONMENT IN TEACHER EDUCATION METHODS COURSES

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Dedication

To my loving family who has supported me through my journey in education and in my life. To my husband who has supported me on this journey of trials and tribulations and yet he asks only for me to succeed. Thank you for being a loving and understanding provider and supporter. I Love You! I would like to acknowledge my children, Julio and Dayshaun; thank you for your great support and for cheering me on to succeed, especially Dayshaun who spent too many nights without his mommy.

I would like to thank my parents Rosa Maria Garcia and Santos M. Garcia, my brother Alex and his wife Josie for their great support, prayers, love, caring, and patience.

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I am blessed for the family and the friends that are in my life may God Bless you all for the support and prayers you have given me.
UNDERSTANDING THE CONSTRUCTIVIST LEARNING ENVIRONMENT IN TEACHER EDUCATION METHODS COURSES

by

VERONICA JACKSON, BIS
Bachelors of Interdisciplinary Studies

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Abstract

This research will see to assess the degree to which teacher education faculty members were able to employ a classroom environment that encouraged a constructivist learning environment and how pre-service teachers feel about their teacher education methods courses at The University of Texas at El Paso (UTEP). The participants in this research were pre-service teachers in their senior year of their undergraduate teacher education program. There were 128 students (110 females, 18 males) enrolled in two sections in the teacher education program, Early Childhood-6 (EC-6) and 4-8 intermediate. The researcher administered the Constructivist Learning Environment Survey (CLES) as a pre survey at the beginning of the fall semester, six weeks into the semester. The post survey was administered 6-8 weeks after the first survey. By using the CLES the researcher was able to explore the degree of teacher education faculty members were able to employ a classroom environment that encouraged a constructivist learning environment. Results showed that the classroom learning was positive and there was uniformity among faculty in their teaching and teaching strategies. They were also able to maintain and encourage a constructivist-learning environment.
# Table of Contents

Acknowledgements ........................................................................................................... v

Abstract ............................................................................................................................. vi

Table of Contents ................................................................................................................ vii

List of Tables ....................................................................................................................... x

Chapter 1: Introduction ........................................................................................................ 1
  1.1 Various Definitions of Constructivism ................................................................. 2
    1.1.1 As a Learning Theory .................................................................................. 2
    1.1.2 As a Learning/Teaching Strategy ............................................................. 4
  1.2 Variations of Constructivism ............................................................................... 5
    1.2.1 Social Constructivism .............................................................................. 6
    1.2.2 Psychological Constructivism ................................................................. 6
    1.2.3 Radical Constructivism ........................................................................... 7
  1.3 Philosophical Underpinnings of Constructivism ............................................... 8
    1.3.1 Learning Theory of Constructivism ...................................................... 9
  1.4 Constructivism in Teacher Education ............................................................... 10
    1.4.1 Resisting Constructivism ..................................................................... 11
  1.5 Overview ................................................................................................................. 13

Chapter 2: Literature Review ............................................................................................. 14
  2.1 Changes In Teacher Education Programs ....................................................... 14
  2.2 Classroom Learning Environments ................................................................. 17
    2.2.1 Constructivism in Teacher Education Programs .................................... 17
  2.3 Performance in Teaching Skills and Constructivism ....................................... 22
  2.4 Instruments Reviewed ......................................................................................... 24
    2.4.1 Survey and Interview Types ................................................................. 26
    2.4.2 Survey Type Only .................................................................................. 30
  2.5 Overview ................................................................................................................. 33

Chapter 3: Methodology ...................................................................................................... 35
  3.1 Region Demographics ......................................................................................... 35
  3.2 The Participants ...................................................................................................... 36
3.3 Institutional Review Board (IRB) Process ................................................................. 37
3.4 Design of the Research ............................................................................................ 38
3.5 The Instrument .......................................................................................................... 38
3.6 The Data Analysis ..................................................................................................... 40
3.7 Overview .................................................................................................................... 41

Chapter 4: Results ............................................................................................................ 42
4.1 Analyzing the Pre-surveys and Post Surveys .............................................................. 42
4.2 Subscales’ Significant Changes .................................................................................. 45
   4.2.1 Learning about the World .................................................................................. 45
   4.2.2 Learning about Constructivism ......................................................................... 46
   4.2.3 Learning to Speak Out ...................................................................................... 46
   4.2.4 Learning to Learn .............................................................................................. 46
   4.2.5 Learning to Communicate ............................................................................... 48
4.3 Overview ..................................................................................................................... 48

Chapter 5: Discussion ....................................................................................................... 51
5.1 Research Questions .................................................................................................... 51
5.2 Main Findings ............................................................................................................. 53
   5.2.1 Subscale 1: Learning About the World .............................................................. 53
   5.2.2 Subscale 2: Learning About Constructivism ..................................................... 53
   5.2.3 Subscale 3: Learning to Speak Out ................................................................. 54
   5.2.4 Subscale 4: Learning to Learn ....................................................................... 54
   5.2.5 Subscale 5: Learning to Communicate ............................................................ 55
   5.2.6 Subscale 6: How I Feel ................................................................................... 55
5.3 Reliability and Validity ............................................................................................... 56
5.4 Limitations .................................................................................................................. 57
5.5 Recommendations for Future Studies ...................................................................... 57
5.6 Conclusion .................................................................................................................. 58
References .......................................................................................................................................................... 60
Appendix A .......................................................................................................................................................... 64
Appendix B .......................................................................................................................................................... 68
Appendix C .......................................................................................................................................................... 72
Appendix D .......................................................................................................................................................... 73
Vita ........................................................................................................................................................................ 74
List of Tables

Table 4.1: Level of Significance ........................................................................................................... 43
Table 4.1.1: Comparing Courses ......................................................................................................... 44
Table 4.1.2: Most Significant Questions ............................................................................................ 45
Table 4.2: Course Comparisons .......................................................................................................... 47
Chapter 1: Introduction

This research sought to explore two things: a) assess the degree to which teacher education faculty members were able to employ a classroom environment that encouraged a constructivist learning environment and b) how pre-service teachers feel about their teacher education methods courses at The University of Texas at El Paso (UTEP). Furthermore, because there has been a limited research done on predominantly Hispanic pre-service teachers located in the U.S.-Mexico border, there was ample reason to conduct this research in a local U.S.-Mexico border. This research was based on the framework of Shirvani (2009) on “whether or not the faculty maintains a classroom that promotes a constructivist learning environment” (p. 245). This thesis project is broken down into five chapters. The first chapter, the introduction, discusses the different definitions of constructivism according to various theorists. Chapter 2, the literature review; discusses classroom-learning environments, performances in teaching skills and constructivism, surveys reviewed, and the survey chosen for this thesis. Chapter 3 describes the methodology, the demographics, the participants, the IRB process, the research design, the instrument used, and the data analysis. Chapter 4 includes the results; it describes the outcomes of the survey and the observations done. Finally, in chapter 5, there is a discussion of the results, as well its limitations, future research recommendations, and conclusions. The thesis ends with references and appendices.
1.1 **VARIOUS DEFINITIONS OF CONSTRUCTIVISM**

In order to understand how pre-service teachers feel about using the constructivist approach of learning we must first understand the concept of constructivism. There are over 300,000 definitions for constructivism and according to Colburn (2000), it is “a philosophical view about the nature of reality and perception, is a theory about how people learn, and — more and more often — represents an array of teaching strategies” (p. 9). The following are the different definitions of constructivism according to theory and those that call it a learning/teaching strategy.

1.1.1 **As a Learning Theory**

James (1992) believed that constructivism in respect to psychology is based on the introspective of ones metacognition and on the self-regulation. For James (1992), this was the Self and people’s thoughts belonged to them. James (1890/91) states that an individual needs to rely on self-examination of one’s own conscious thoughts and feelings. In our minds this is where we report our discoveries. Yilmaz (2008) adds that “psychological constructivism [is the] approach [that] relates to a developmental or learning theory that suggests that individual learners actively construct the meaning around phenomena, and that these constructions are idiosyncratic, depending in part of the learners’ background knowledge” (p. 161). It is a phase of insightful requirement and the habits and will that one has in order to want to learn (Yilmaz, 2008).

Piaget (1983) sees constructivism as the mechanism of assimilation, accommodation and equilibration. Take for example, Piaget’s idea originated from the fundamental postulates that:

1. When an organism adapts itself to the environment in which it lives in it will grow and having an interaction with tis surrounding such as the external conditions, the resources, and
stimulation; (2) the adaptation of intelligence comes from within; people are born with it, except that intelligence is shown at different stages as people mature; and finally (3) cognitive is a continuous creativity that happens when there are interactions with the real world and it is not something that is formed previously (Piaget, 1983).

Piaget (1983) sees constructivism as a guide to academic growth and natural development, which is the adaptation and organization. This means that in order for students to endure a learning environment, students must adapt to physical and mental stimulation. This is where assimilation and accommodation is part of that process as well as part of his theory. The organization part of constructivism is the equilibrium that students need for mental structure adaptation; it is the experience of the physical and the social environment that permits for cognitive development and effective thought process, according to Piaget (1983).

Lastly, Vygotsky (1978) strongly ascertained that constructivism is the process in which learners learn by integrating knowledge through social context. According to Vygotsky (1978) a child’s development appears during cultural development at a social stage and at an individual stage; it also occurs between people (interpsychological) and within themselves (intrapsychological). Vygotsky (1978) also highlights the critical role of language and culture on how students develop intellectually and how they see the world. Vygotsky’s theory of Zone of Proximal Development (ZPD) is the basis of his theory, where learning and development are related to one another. For example, students begin to learn about arithmetic in school, however, the language and culture of this subject was learned through previous experience. Such experience was learned at home in a much different language and context. Such learning comes from assimilation when the child is learning and assimilating the shapes and numbers in their environment. Another example would be when children learn to speak or act, they imitate the
adults and children learn new skills. For this reason, Vygotsky strongly asserts that learning and development are interconnected from the time children are born.

1.1.2 As a Learning/Teaching Strategy

According to Van De Walle (2004) constructivism is an insight on how students learn and provides instructional strategies for teachers to use in student-centered classrooms rather than teacher-centered. When teachers and students work together, they can develop an understanding of the concepts/content that is presented. The use of a problem-solving approach, encourages students to think. The author notes that a constructivist approach to learning involves using strategies that have a rationale behind problem-solving approaches, planning and assessing, using inquiry-based techniques as well as teaching strategies using technology (Van De Walle, 2004). Van De Walle encourages pre-service teachers to experience what it means to make sense of concepts taught, there is not always a right answer, engage in conversation within the classroom, and to see things as a cooperative effort. Pre-service teachers are not to dispense knowledge, but instead be a facilitator.

Constructivism gets students involved, teaching them to construct meaning in what they are learning and experiencing by using tools such as problem formation, resolution, research and reasoning. Also, tools to help socially as such as communication, negotiation, conflict resolution, collaboration, as well as assisting them to develop and use tools to find information (King, n.a.; Yilmaz, 2008).
Cojocariu (2010) stated that Adams and Burns (1999) created their definition of constructivism based on six principles. The principles are:

1. what the “learner brings into the process their most significant knowledge and experiences;
2. learning is controlled internally and mediated;
3. tools, resources, experiences and context help build knowledge in various ways;
4. learning occurs through accommodation and assimilation, transforming old mental models into new ones;
5. learning is an active and reflective process;
6. social interactions provide multiple perspectives on knowledge construction (as cited in Cojocariu, 2010, p. 155).

The author also states that constructivism is centered on the successes in “cognitive psychology, social psychology,” (p. 155) and wide-ranging inquiry in the “science of education and of neurology” (Cojocariu, 2010, p. 155).

1.2 Variations of Constructivism

With the different types of strategies in constructivism it is important to know that “an educator is expected to understand the educational theory and theories behind a given instructional framework to gain success” (Yilmaz, 2008, p. 161). There are three learning theories, “behaviorism, cognitivist, and constructivism” (Yilmaz, 2008, p. 161). Within these theories, exist three major traditional facets of constructivism which are “educational constructivism, sociological constructivism, and philosophical constructivism” (Matthews, 2000, p. 169). According to Matthews (2000) there are 18 forms of constructivism within these three major faces of constructivism and these 18 forms are “in terms of contextual, dialectical, empirical, information-processing, methodological (as cited in Yilmaz, 2008, p.163), moderate,
Piagetian, post-epistemological, pragmatic, radical, realist, socio-historical, humanistic constructivism, didactic constructivism, socio-cultural, pragmatic social constructivism, and socio-transformative constructivism (as cited in Matthews, 2000, p.170). Up until now, many theorists and scholars put these under three categories: (1) social constructivism (Matthews, 2000; Vygotsky, 1978; Yilmaz, 2008), (2) psychological constructivism (Piaget, 1983; Yilmaz, 2008), and (3) radical constructivism (Matthews, 2000; Yilmaz, 2008). It is important that everyone entering into the education program is aware of the different variations within constructivism.

1.2.1 Social Constructivism

Social constructivism was derived from Lev Vygotsky and supported by Rosalind Driver in science education and Paul Ernest in mathematics education (Matthews, 2000). Social constructivism is referred to as a sociological theory of knowledge. It is applied in social settings, in groups of individuals to construct knowledge for one another, groups work collaboratively in sharing knowledge and meaning (Matthews, 2000; Piaget, 1983; Posner et al., 1982; Rainer & Matthews, 2002; Tobin & Tippins, 1993; von Glasersfeld, 1992; Vygotsky, 1978; Walker et al., 2011; Yilmaz, 2008). Social constructivism is closely related to social constructionism in which people are working together to construct artifacts. However, social constructivism focuses on the individual’s learning that takes place due to group interaction.

1.2.2 Psychological Constructivism

Psychological constructivism (also known as individualism constructivism) was derived from Thomas Kuhn’s work and is supported by Bas van Fraasen and goes as back as Ancient Greece and Aristotole (Matthews, 2000). Psychological constructivism is how Yilmaz (2008) states: …“learners actively construct the meaning around phenomena, and that these
constructions are idiosyncratic, depending in part on the learners background knowledge” (p. 163). Hymans (2010) also states: …“psychological constructivism represents a major challenge to all of the currently dominant approaches” (p. 461). These approaches are geared towards the individual’s behavior. Meaning that by using psychology as it was originally intended for constructivism it can explain deviations in behavior based on rationality (Hymans, 2010). Also psychology constructivism can be divided into several theoretical directions, one being cultural theory.

1.2.3 Radical Constructivism

Radical constructivism is referred to both a learning theory and a pedagogical model. It is a process of an active adjustment towards practical interpretations of experience. It is strongly advocated by Ernst von Glaserfeld and had made a great influence in the development of radical constructivism. His position is “based on the practices of psycholinguistics, cognitive psychology and the work of Jean Piaget” (as cited in Matthews, 2000, p. 172). Radical constructivism is “assumed that external reality cannot be known and that the knowing subject constructs all knowledge, ranging from everyday observations to scientific knowledge; knowing thus inevitably reflects the perspective of the observer” (as cited in Yilmaz, 2008, p. 164). What does this mean? This means that when a learner first sees something the individual is constructing knowledge and experience, then depending on the surroundings and social context the knowledge is now constructed, and finally finding connections, it is the type of learning theory and pedagogical model. In order to learn the different variations of constructivism, research must be done extensively and individually to truly begin to understand the depth of constructivism and its approaches.
1.3 **Philosophical Underpinnings of Constructivism**

What is the philosophical view about constructivism? To start, it advanced from the disappointment of “traditional Western theories of knowledge” which contrasts heavily with “objectivist epistemology and positivism” (as cited in Yilmaz, 2008, p. 161). Constructivism postulates that knowledge does not “exist outside our minds; —and knowledge is not discovered but constructed by individuals based on experiences” (as cited in Yilmaz, 2008, p. 162). It is how people see reality and what their perception about it is. There is no true or false, but instead it is what everyone agrees on (Colburn, 2000). Because everyone sees and thinks differently, reality is what the individual makes out of it and what works best for that individual. The simple fact is that in a classroom, all students can have the exact same lesson activity and lecture; but once students write a reflection about what they learned during the lecture and the activity performed all reflections, will be different. Everyone learned something different about that lesson, the form in which the lesson was approached was different, and in the end, everyone finished the activity successfully, but with a different way of thinking. The constructivist learning theory also includes cognitive constructivism as part of the philosophical underpinnings of constructivism and many theorists throughout the years consider it as the grandfather of teaching and learning methods. Cognitive constructivism is based on how an individual constructs ideas through personal process and personal experience. Piaget’s cognitive developmental theory proposed that people should not be given information in which people can understand and use; instead, people should construct their own knowledge (Powell, 2009). This includes Piaget’s four developmental stages: sensorimotor ages 0-2; preoperational ages 2-7; concrete operational ages 7-11; and formal operational ages 11- adulthood.
1.3.1 Learning Theory of Constructivism

According to Plourde and Alawiye (2003), constructivism as a theory “is simply a learning or meaning-making theory —this theory proposes that people create their own meaning and understanding, combining what they already know and believe to be true with new experiences with which they are confronted” (p. 336). Von Glasersfeld (1992) also states that it is a process in which it is a “synthesis where one acknowledges that understanding is personally constructed, but modified by the social context in which learning takes place” (as cited in Plourde & Alawiye, 2003, p. 336). Even within this theory, there is controversy among science educators. Some of these controversies are associated with the perception of reality during a particular time and culture in which people live in. Such problems can come from two people observing the same situation, during a different time and culture (Colburn, 2000). For example, would people perceive reality differently if they lived two hundred years ago, in a place where people’s perceptions about religion were different from yours, even though it was seen in the same situation as you today (Colburn, 2000)? Since perception is seen differently among every individual, therefore, everyone learns differently. For this reason, many pre-service teachers come with different experiences, beliefs, and perceptions about science or any other subject area.

How can pre-service teachers apply this learning theory? This is where the constructivist approach to learning to teach comes in handy to help pre-service teachers understand and connect their way of thinking and beliefs about how science and other subject areas work in order to accommodate and meet the standards that the education community has established to be an adequate justification. After all, “the key point, though, is that students are far from being ‘empty vessels’ waiting to be filled with new knowledge” (Colburn, 2000, p. 10). Yilmaz (2008) and Colburn (2000) both agree that learners are individuals that can ask questions, can perform
problem-solving, construct theories and knowledge instead of just being ‘empty vessels’. It is about developing the learner’s thinking and having a place where intelligence exists and is facilitated by both the teacher and the student. This is why it is important to adapt to different ways of teaching strategies that can help students to “identify misconceptions, understand some reasons for their persistence, understand their own ideas, —the problems with their beliefs, and alternative beliefs that work better for them personally” (Posner et al., 1982, p. 211). For these reasons and a few more, the U.S. Department of Education has made an impact in trying to establish standards that can better prepare pre-service and in-service K-12 teachers.

1.4 **Constructivism in Teacher Education**

Many pre-service teachers may not know the meaning behind constructivism and they may only know the basis in which it represents the teaching strategy used in order to teach. In addition to this, Haney, Lumpe, & Czerniak (2003) came to the conclusion that if pre-service teachers come into the field of education with the notion that classrooms are formed in rows and columns face the front of the room and the teacher lecturing at all times, it is most like that this pre-service teacher may teach their class the same way. Haney et al. (2003) also found in their research that individuals form their beliefs about teaching at a very early stage as early as pre-kindergarten and kindergarten and many times these beliefs are hard to change, especially once you reach adulthood. In Pajares’ (1992) investigation, the author realized that beliefs regarding personal attitudes and stances could powerfully affect your comprehension and mindfulness of occurrences. For this reason, pre-service teachers who do not have a clear understanding of what the true meaning and philosophical view of constructivism is may not only not use the learning approach, but also these pre-service teachers become resistant in using constructivism as part of the curriculum.
1.4.1 Resisting Constructivism

Rodriguez (1998) reports that pre-service teachers that become resistant to using constructivism fall under two categories ‘resistance to ideological change’ and ‘resistance to pedagogical change’. The ideological change of resistance can come from a variety of issues that pre-service teachers have to face. Such issues are their feeling of “disbelief, defensiveness, guilt, and shame that —pre-service teachers experience when they are asked to confront racism and other oppressive social norms” (Rodriguez, 1998, p. 189) that can and could take place in the classrooms. Such issues can usually take place in courses that deal with multicultural education, sociology, and psychology. The pedagogical change comes from the role that many pre-service teachers have to face in order to “manage conflicting messages from their cooperating teachers—and from their university supervisor” (Rodriguez, 1998, p. 189). An example of managing conflicting messages could be a pre-service teacher is expected to implement a lesson using the 5E model they learned in their teacher education methods course, however, their cooperative teacher (CT) refuses to use the 5E model instead the CT wants for the pre-service teacher to use guided-inquiry. Other conflicts come from going over the curriculum and upholding control of the classroom to putting into practice a student-centered environment and keeping a constructivist classroom. Rodriguez (1998) calls this resistance as ‘sociotransformative constructivist orientation’ (STC). The author believes that by using STC can help pre-service teachers to learn to teach for diversity and understanding; these are called ‘pedagogical strategies for counter-resistance’.

These pedagogical strategies for counter-resistant pre-service teachers can give a more concrete approach that will allow them to face challenges of learning to educate with diversity in order to put into practice a more culturally inclusive and socially relevant pedagogy (Plourde &
Alawiye, 2003; Rodriguez, 1998). It will also allow pre-service teachers to educate for understanding, which means putting into practice a more critically engaging and academically meaningful pedagogy (Plourde & Alawiye, 2003; Rodriguez, 1998). Teacher education program could implement strategies that will train pre-service teachers to work “respectfully and effectively with children of diverse backgrounds such as socioeconomic status, cultures, ethnicities, abilities, and sexual orientation,” just to name a few (Rodriguez, 1998, p. 593). These changes can help resistant pre-service teachers that resist ideological change to be more conscious. It can change their perspectives from practicing with good intentions, to daily practice in challenging and diverse environments in the classroom. This will also increase their pedagogical knowledge and skills. Another strategy that teacher education programs could use to help pre-service teachers that resist pedagogical change can be to combine social constructivism and multicultural education (Rodriguez, 1998). This combination can assist resistant pre-service teachers to have a better “insight on how to address the complex socioeconomic, cultural, institutional, and historical issues influencing teaching and learning in schools” (Rodriguez, 1998, p. 598). Some additional strategies that accompanied constructivism in teacher education can be inquiry-based, cooperative learning, the 5E model, open-ended activities, questions and wait time, demonstrations such as discrepant events and predictions, in-depth discussions, project based research, and assessments, and these are just a few under constructivism. In addition to these strategies and combining strategies from ideological and pedagogical changes can prepare a pre-service teacher to be a better diverse and well-rounded individual in a constructivist-learning environment.
1.5 Overview

Chapter 1 includes a description of the various definitions of constructivism according to its concept theory and learning/teaching strategies, the variations of constructivism, philosophical underpinnings of constructivism, learning theory of constructivism, and constructivism in teacher education. Chapter 2 is a review of the literature on changes made in teacher education programs, classroom-learning environments, performances in teaching skills and constructivism, and instruments reviewed in order to choose one that would deem appropriate for this research.
Chapter 2: Literature Review

2.1 Changes in Teacher Education Programs

Changes in education continue to evolve as new research continues to make wave for new strategies to be used on students from K-12 and college level as well as new professional development training programs for pre-service teachers, novice teachers and in-service teachers. As more and more pre-service teachers enter into K-12 teacher education programs, the demand for providing them with the knowledge and skills of constructivism becomes more imperative. However, the problem lies on the mismatch between the learners’ needs and the methods of teaching especially in K-8 pre-service teachers and it increases as the grade level increases (Plourde & Alawiye, 2003; Weiss et al., 2001). Another problem that arises in pre-service teachers is that if they do not believe in constructivism (Plourde & Alawiye, 2003; Rodriguez, 1998), then the learning strategies they have acquired in their teacher education program will not be effective and many resort to a teacher-centered classroom learning environment (Plourde & Alawiye, 2003; Weiss et al., 2001). However, if the pre-service teachers believe in constructivist teaching and uses it in a way that makes “sense to what they see, think, and do” (Tobin & Tippins, 1993, p. 87) then, they will be able to convey that same knowledge and skills to their students and promote a constructivist learning environment.

What are some of the efforts being done by the public schools and universities? For one, the schools are promoting a change in direction from traditional teaching, learning and training, to a more student-centered classroom learning environment that promotes constructivism. Many universities are re-examining their curriculum, faculty members are evaluating and updating their courses, improving relevance and success measures by recognizing students’ diverse learning styles, and enhancing student preparation (Horel, Ziegenfuss, & Perry, 2013; Al-Weher, 2004).
They are continuously re-evaluating the department’s goals and proposing effective changes that would increase the teacher education’s efficiency (Al-Weher, 2004). These changes can also be seen here at UTEP, as they continue to find different ways to implement and promote a constructivist learning environment. UTEP continues to implement constructivist classroom learning environments throughout all levels of the teacher education programs, from undergraduate programs to doctoral programs. Weiss et al. (2001) stated that “various reform efforts may focus initially on different parts of the … education systems, e.g., curriculum, assessment, or in-service teacher education, [however,] there is a consensus that having a well prepared teaching force is essential for an effective —…education” (p. 7). As Torch (2000) argued “students cannot be expected to master today’s higher standards without having teachers capable of teaching the higher standards.” (as cited in Kornfeld et al., 2007, p. 1904). This is why it is crucial that pre-service teachers understand the importance of having a good constructivist learning environment, the appropriate academic training as well as proper field experience.

These kinds of changes can make a big difference on how pre-service teachers perceive teacher education programs and how they feel about the curriculum, they are receiving from these colleges and universities. As these higher learning institutes make standard changes in required teacher certifications they must also make changes on how faculty members teach these required courses. In addition, faculty members must use a variety of strategies that promote constructivist-learning environment, which in turn will promote a positive student-centered classroom-learning environment. If pre-service teachers have a positive learning experience in a constructivist-learning environment they will most likely use these same strategies once they acquire their own classrooms. As mentioned before, constructivism is about getting students involved and this includes pre-service teachers in the teacher education programs, teaching them
to construct meaning in what they are learning and experiencing by using tools such as problem formation, resolution, research and reasoning. Also, tools to help socially as such as communication, negotiation, conflict resolution, collaboration, as well as assisting them to develop and use tools to find information (King, n.a.; Yilmaz, 2008).

The constructivist learning model was developed by Piaget and Vygotsky, it focuses on creating an equilibrium such as “when [a] student encounters contradictory information, the learner tries to reach equilibrium” (Shirvani, 2009, p. 246). In addition, it also focuses on socio-culture in which students learn by “being active participants within their learning environment, - [through] social experiences [which] determine[s] how people think and learn concepts through self-discovery, and social interactions [which] helps activate learners’ higher cognitive levels” (Shirvani, 2009, p. 246). These concepts can be used in order to create a constructivist-learning environment in a student-centered classroom. As stated by Weiss et al. (2001) “there is a consensus that having a well prepared teaching force is essential for an effective —education” (p. 7) and an effective education comes from effective and well prepared pre-service teachers.

The primary goal of this research focuses on teacher education methods courses at The University of Texas at El Paso. This research sought to assess the degree to which teacher education faculty members were able to employ a classroom environment that encouraged a constructivist learning environment and how pre-service teachers feel about their teacher education methods courses at UTEP. The following are the research questions this research will attempt to answer:

- Do faculty in teacher education programs in the areas of science, mathematics, and social studies in the UTEP College of Education maintain and promote a constructivist classroom-learning environment?
• How do pre-service teachers feel about the constructivist-learning model?

The participants in this research were pre-service teachers in their senior year of their undergraduate program of Teacher Education at UTEP. This research follows the framework of Shirvani’s (2009) study on “whether or not the faculty maintains a classroom that promotes a constructivist learning environment” (p. 245). The difference between these two studies was the number of participants. The majority of the participants were of minority race/ethnicity, and the teacher education methodology courses are in science, mathematics, and social studies.

2.2 CLASSROOM LEARNING ENVIRONMENTS

2.2.1 Constructivism in Teacher Education Programs

Pajares (1992) inferred his findings that classroom-learning environments are usually based on teachers’ beliefs and these beliefs are usually formed as early as preschool or kindergarten. Many times teachers, students, parents, and the community seek these traditional teaching strategies that solicit a teacher-centered classroom learning environment and it is very rare that as adults teachers change these beliefs (Haney et al., 2003). It is also well-known that beliefs, personal philosophies and viewpoints can strongly manipulate perception of phenomena (Haney et al., 2003). A teacher who teaches constructivist strategies may find themselves struggling against those whom are against change in teaching strategies. However, Haney et al. (2003) mention they have seen great “improvements in classroom discourse, increased achievements in science, and altered misconceptions in science” (p. 367). These improvements were made possible through studies done by science educators in implementing various programs and studies in utilizing the constructivist approach to teaching (Haney et al., 2003). The constructivist approach to teaching has influenced the science education community more so than in any other area of concentration, this is according to American Association for the
Advancement of Science (AAAS), the National Research Council (NRC), and the National Science Teacher Association (NSTA) (Aud et al., 2011; Haney et al., 2003; Matthews, 2000). Even though these strategies can be used in any subject area; pre-service teachers and in-service teachers would need to have the knowledge and understanding on how to use and implement constructivist-learning strategies in their classrooms in order for this approach to be successful and for students to benefit from it.

Classroom learning environments can be positive if the teacher chooses to have a positive environment in their classroom. According to Willms (2010) “a number of detailed studies of teachers’ behaviors found that certain teaching practices are associated with student learning” (p. 1009-1010). This meant that teachers’ behaviors can have a significant effect on classroom learning environments. Two significant essential features were the use, the use of class time and instruction that is planned and adaptive, and an effective curriculum that requires students to take a fundamental set of academically oriented classes. The content and pace of the curriculum can play a key role in the learning environment of a classroom (Willms, 2010). Yager (1991) presented a model that was developed by the National Center for Improving Science Education and this model was based on the constructivist learning model (CLM) (Yager, 1991). This CLM has four aspects in which it concentrates on invitation, exploration, proposed explanation and solution, and taking action (Yager, 1991). The CLM includes a self-check instrument in which it determines to what extent a teacher bases their practice on constructivist learning theory, and the author recommends that this instrument and model be used in teacher education programs in order to better prepare pre-service teachers (Yager, 1991). Teacher education methods courses should teach these critical elements to pre-service teachers in order for them to use their time wisely and plan curriculum that will justify the time allotment in a real classroom environment.
This can also help pre-service teachers to learn organizational skills and apply these skills during their student teaching semester or in their future classrooms. Not only will pre-service teachers learn these strategies, they will be able to put them to the test and learn from the examples their professors set. By failing to learn or master these strategies, pre-service teachers can fail to give adequate learning instruction to their students, but can also run the risk of falling behind and playing catch-up. This can cause an unnecessary stressful learning environment for both the novice teacher and the students.

As research continues to develop over the years, there is no doubt that the quality of the classroom environment is the most noteworthy influence of student learning (Den Brok, Fisher, Rickards, & Bull, 2006; von Glasersfeld, 1992; Pajares, 1992; Taylor & Fraser, 1991). By having a stress free environment, students can learn and perform better as well as have a positive point of view towards the curriculum being taught. Researchers believe that:

Students’ perceptions of — classroom environment account for appreciable amounts of variance in learning outcomes. [In addition,] students’ perceptions of their teachers’ behaviours do act as one set of important mediators between the actual behaviours of teachers and the actually performance of learning activities by each student (Den Brok et al., 2006, p. 4).

It is crucial that faculty members in teacher training programs have a positive rapport with their pre-service teachers and vice versa. When faculty has a positive and enthusiastic attitude towards their content curriculum, pre-service teachers will perceive this behavior and it will stimulate the student learning and the environment. Pre-service teachers will look forward to attending the course and will feel confident that the content they are learning is effective. Pre-
service teachers will then simulate the same behaviors, strategies, and attitudes in their student teaching semesters and future classrooms.

For this reason, it is important that pre-service teachers feel positive about using a constructivist approach to teaching, but it is also important that pre-service teachers have the knowledge and skills to accomplish this task while feeling that they have ownership of their curriculum. Rainer and Matthews (2002) stated that “in order to learn something in depth, one must see relevance in the learning [and] one must read deeply and widely” (p. 26). This can help pre-service teachers to read and research deeply on constructivism in order to have the understanding they need to create effective constructivist lessons in which students will benefit from in the end. Having highly prepared, knowledgeable and skilled pre-service teachers on constructivism will make it possible to face the challenges of educating the students of today in an imaginative and inspiring way. Pre-service teachers will be able to prepare the students for state mandated-exams such as the State of Texas Assessment of Academic Readiness (STAAR) and meet state standards with confidence rather than with fear of failure and ridicule by their new employers.

Giving pre-service teachers the tools and knowledge they will need once they start working is critical. The tools being used in the classroom should match those that are being used in the real world. It is expected of in-service teachers to teach their students subjects related to real world examples, but as the student goes up on grade level and eventually graduates, those tools are not used or they become outdated. So how can these students perform everyday tasks on the job, in personal life, or in school at a higher education institute? Take for example an elementary teacher education program in which teachers integrate technology into their lessons, but the computer software and/or hardware used is outdated. As a result, pre-service teachers
were not provided with the proper technology they needed for their classrooms, therefore, they
did not have the knowledge, skills, and confidence they needed to be an efficient and effective
constructivist novice teacher (Sahin, 2003).

In addition, the experience they have during their student teaching internship plays a very
important role on the kind of teacher the individual becomes once in their own classroom. Many
pre-service teachers compare their experiences in the classroom with those during their student
teaching experience. According to Bohning (1999), pre-service teachers go through a series of
teaching developmental stages, especially where pre-service teachers are comparing their
experiences in class versus their student teaching. Bohning (1999) describes these stages as
developmental concerns:

1) Pre-teaching concerns-identifying realistically with pupils but unrealistically
with teachers; 2) concerns for survival-mastery of content, adequacy in fulfilling
role, classroom management; 3) teaching performance concerns-limitations and
frustrations of teaching situations; and 4) concerns related to pupils as individuals-
their social, academic, and emotional needs (p. 147).

They compare their knowledge and skills they have acquired to using them in a real
classroom setting in order to see if they are capable of teaching. Pre-service teachers also
compare their technology knowledge to that of what public schools are using. They also compare
the constructivist teaching strategies that the university pushes for pre-service teachers to learn
and use during their class activities and implement them during their student teaching experience
to those of their cooperative teacher supervisors. Making these comparisons can lead to some
concerns that pre-service teachers have. Many times what is taught in class is not the same
procedure or strategies that are being used in schools or at least depending on the cooperating
teacher on how he/she teaches. The participants in Bohning’s (1999) study “had concerns about ‘not knowing how to teach correctly,’ ‘afraid activities will be a disaster,’ ‘that [they] will run out of ideas,’ and if they ‘have enough hands-on things’” (p.146) these are just a few examples of concerns that pre-service teachers face during their student teaching semester. All these factors can hold great significance for a pre-service teacher, especially in a competitive field where knowledge and skills carry a ‘high value’ when searching for a teaching job.

Constructivism is a “learning active process and that learning are determined by the complex interplay among learner’s existing knowledge, the social context, and the problem to be solved” (as cited in Sahin, 2003, p. 68). If pre-service teachers are constructivist and are confident in their knowledge and skills they will be able to project that encouragement and excitement onto their students as well as motivating them to learn.

2.3 Performance in Teaching Skills and Constructivism

A research study conducted by Plourde and Alawiye (2003) found that as pre-service teachers learned more about constructivism and how to apply it, they felt more confident about the theory. They had a positive belief in constructivism and their beliefs in it made them more likely to apply constructivism in their classrooms. The authors have also seen “that elementary science education is lacking in areas that will equip pre-service teachers to effectively teach science to elementary students once they enter their chosen professions” (p. 334). This usually happens due to the poor performance of students in state mandated exams like STAAR and in class assessments. In addition to poor performance on assessments, educators have disputed that science education is extremely important for elementary schools “to develop in students the knowledge, reasoning, and problem solving skills required for a rapidly changing and technological base society” (American Association for the Advancement of Science, 1993; also
as cited in Plourde & Alawiye, 2003, p. 335; National Science Teachers Association, 1996). These problems also begin from the mismatching of learner needs and teaching techniques, particularly when preparing elementary pre-service teachers.

Education reform continues to make changes in advocating schools to incorporate a constructivist approach of learning into their curriculum and many teacher preparation programs across the country in higher education institutes are incorporating the constructivist approach into their curriculum (Plourde & Alawiye, 2003). An example of this can be seen here at The University of Texas at El Paso. Many faculty members at the university confidently believe and advocate for constructivism. Many teach their undergraduate courses using the constructivist approach when the course is mainly taught face-to-face and some use it during their online courses for undergraduate students. However, since the graduate program is more intense, it is seen whether the course is face-to-face, online, or hybrid. They can all incorporate this approach and it gives the in-service/pre-service teachers a much better insight on how to incorporate many of these strategies. Sometimes even pre-service teachers who have never worked in the field of teaching and are attending the graduate program have made a difference on how they see and feel about constructivism. They feel confident, knowledgeable and skilled that they can incorporate this approach into their own future classrooms.

In addition, if higher education institutions were to incorporate more concrete learning, it could enhance the learning between elementary and middle school education pre-service teachers. Researchers have found that teachers, who are determined, take risks, and are inventive are more likely to implement constructivist learning strategies in their classrooms (Adams, 2011; Anderman, 1998; Casey et al., 2008; Lewis, 2009). They are more likely to have a student-centered classroom and their lessons are inquiry-based (Adams, 2011; Anderman, 1998; Casey et
al., 2008; Lewis, 2009; Tobin, Roth, & Zimmerman, 2001; von Glasersfeld, 1992). In contrast,
teachers who do not possess these behaviors are more likely to use guided lessons, have teacher-
centered classrooms, and ask students to work from their textbooks (Adams, 2011; Anderman,
1998; Casey et al., 2008; Nehring, 2011; NRC, 1996; Plourde & Alawiye, 2003; Posner et al.,

If the pre-service teacher believes in constructivist teaching and uses it in a way which
will make “sense to what they see, think, and do” (Tobin & Tippins, 1993, p. 87), they will be
able to convey that same knowledge and skills to their students. However, if they do not, then the
learning strategies will not be effective (Plourde & Alawiye, 2003; Weiss et al., 2001). It is
important that pre-service teachers have this deep understanding of constructivist approach of
learning and its strategies, but they also need to become knowledgeable about how they can be
effective in using constructivism. Observing other researchers’ work on this topic will help pre-
service teachers to better implement the strategies that they are already becoming familiar with
during their undergraduate studies. They will learn to be efficient and effective as well as able to
implement the new standards for education.

2.4 **Instruments Reviewed**

As mentioned several times, it is crucial that pre-service teachers be prepared with the
knowledge and skills that is required to teach in a constructivist approach as well as believe in
the model. Using the constructivist approach is the best methodology to use in order for students
to be successful in not only school, but as future scientists, business men/women, or good
citizenship. It is surveys such as the ones that are discussed in this chapter that can make a
difference for pre-service teachers to be better prepared, knowledgeable and skillful enough to
tackle the obstacles that they may have and/or encounter.
In this thesis, a survey was conducted in order to determine the number of teacher education faculty members who were able to develop or facilitate a classroom environment that encouraged a constructivist-learning environment. The research also established how some pre-service teachers feel about their teacher education methodology courses at UTEP. This research followed the framework of Shirvani (2009) on what constitutes constructivist learning and to what degree do specific strategies were compatible with constructivism. The survey that was employed in this thesis was the Constructivist Learning Environment Survey (CLES), which was used in Shirvani’s study. In the study, the researcher had 49 pre-service teachers enrolled in K-8 mathematics methodology courses. By using the CLES survey, I will be able to answer the research questions that were explored in this thesis. These questions are (1) Do faculty in teacher education programs in the UTEP College of Education maintain and promote a constructivist classroom-learning environment; and (2) How do pre-service teachers feel about the constructivist-learning model? In using this method I am hoping to prove that it is important for pre-service teachers to strongly believe in the theory of constructivism and having the knowledge and skills to perform and maintain a constructivist classroom learning environment that can make them successful teachers.

It has been seen that by having a positive and motivating classroom-learning environment can help students achieve the goals they need to meet and for faculty to maintain a constructivist learning environment in their classrooms, in addition it will also spark the interest in wanting to learn. Even though motivation is not part of this thesis, it is a factor and/or component of constructivism and maintaining a positive learning environment. There are several research studies based on the classroom-learning environment and pre-service teachers’ beliefs about constructivism. These studies can be the key components that students need in order to be
motivated to learn as well as pre-service teachers to understand that the kind of environment they have in their future classroom is the key element for a successful constructivist learning approach.

For example, there were several studies found, but only five topics were discussed regarding pre-service science teachers, in-service teachers, and faculty on (1) beliefs on constructivism in science classrooms, (2) teachers’ perceptions of classroom practices, (3) does instruction correspond to constructivist learning, (4) pre-service teachers’ self-efficacy, and (5) ownership learning in teacher education programs. All these researches used different methods of collecting data. These categories are broken down into two types of methods, surveys and interviews and surveys only.

2.4.1 Survey and Interview Types

In Ogan-Bekiroglu and Akkoç’s (2009) investigation the goal was to “determine pre-service physics teacher’s instructional beliefs and to investigate the relationship between their beliefs and practices. [Their] theoretical framework was based on the combination Haney and McArthur’s research and Ford’s (1992) motivation systems theory” (Ogan-Bekiroglu and Akkoç, 2009, p. 1173). Ogan-Bekiroglu and Akkoç (2009) conducted their study by using interviews, observations and written documentation. The authors’ conducted their study in Turkey and the participants consisted of six pre-service teachers, three females and three males. These pre-service teachers came from different backgrounds, teaching experiences, and they were all from the same course sections. The interviews were conducted by the authors and with each participant. On the first interview the authors were able to determine the participant’s instructional beliefs by using the “Pre-service Teacher’s Instructional Beliefs (PTIB) instrument —[in which] this instrument [was] related to classroom environment, teaching activities and
assessment, teachers’ roles, and instructional goals. The second and third interviews were related to the participants’ instructional practices in the methods course and the school settings” (Ogan-Bekiroglu and Akkoç, 2009, p. 1180-1181). The authors also collected descriptive field notes during their observations and conducted a revised version of the Constructivist Teaching Inventory (CTI) that was developed by Greer, Hudson, & Wiersma (1999)” (as cited in Ogan-Bekiroglu and Akkoç, 2009, p. 1181). The CTI was used in order to measure instructional practices and it measures four categories: Community of Learners, Teaching Strategies, Learning Activities, and Curriculum-Assessment (Ogan-Bekiroglu and Akkoç, 2009). The results turned out to show that:

Four pre-service teachers held constructivist instructional beliefs while one pre-service teacher held transitional beliefs and the other pre-service teacher held traditional beliefs. [—as for their practices they saw that the] four pre-service teachers’ instructional practices [were] aligned with their overall beliefs; two of them changed their practices — and performed in such a way as to have an inconsistent belief-practice (Ogan-Bekiroglu and Akkoç, 2009, p. 1186).

As you can see it is important to understand how pre-service teachers’ feel about the techniques and strategies they are using. Most importantly if the pre-service teacher believes in the constructivist learning model their practices will show consistency.

In the research study conducted by Rainer and Matthews (2002) on “Ownership of learning in teacher education” (p. 22) was emphasized in the Masters of Education program. Rainer and Matthews’ (2002) study was based on their own desire as faculty for a deeper understanding of the work they do and then use this to enhanced their understanding to improve their own practice. They want “to learn to prevent ‘…stagnation; …to reset, reorganize, recode,
and thus to give additional meaning to what is’” (p. 22, as cited in Spivey, 1996, p. 1). Rainer and Matthews (2002) wanted to be able to understand what ownership in the graduate teacher education program is and to (a) recognize strategies to encourage ownership; (b) increase comprehension in the classroom of teachers’ perceptions of ownership; and (c) recognize ways for teachers to encourage ownership in their classrooms. Their participants consisted of 20 K-5 teachers and two faculty guides. Teachers were divided into two groups-- the mathematics teachers and the literacy teachers-- and each faculty worked with one group. The study was based on information that was gathered from weekly meetings in order to plan and reflect on their own work, two observations and a follow-up conference with each teacher, and they had group discussions about their victories and struggles (Rainer & Matthews, 2002). Rainer and Matthews (2002) used “an open-ended questionnaire and a survey [in order] to gather more specific data on the teachers’ beliefs, interpretations, and perceptions of ownership in their work” (p. 24). The authors’ questionnaires addressed four topics “(a) their definition of ownership; (b) examples of ownership from their classroom; (c) changes in themselves as a result of ownership; and (d) changes in their children as a result of ownership. The survey was a 35 item Likert-scale instrument developed from [their own] literature review” (Rainer & Matthews, 2002, p. 24). The survey was based on the teachers’ “beliefs, opportunities, and actions related to ownership and empowerment, specifically, voice, support, relevance and trust” (Rainer & Matthews, 2002, p. 24). This study revealed that 95 percent of the teachers strongly believed in the importance of ownership in learning. The teachers also believed that being able to connect, share dialog and experiences as well as relate to their work was crucial in order to feel ownership. Rainer and Matthews (2002) also found that some teachers had difficulty acting on their beliefs in the graduate program even when they were given the opportunity of ownership; others were
convinced that their voices were not strong enough to be heard, important and influential. Others remained silent and the professors needed to initiate other strategies like chalk talk in order to give these teachers a voice. However, 98 percent of the teachers gained new insights about themselves as learners and acknowledged that their ideas were valued. It is important that pre-service teachers feel ownership in the work they do and learn in order to feel confident in teaching using the constructivist approach of learning.

Tafrova-Grigorova et al. (2012) conducted two studies, one based on a Classroom Learning Environment Survey (CLES) and the second one on an open-ended questionnaire interview. Both of these were given to 30 Bulgarian science teachers in 28 schools located in 9 areas of Bulgaria. On the CLES survey Tafrova-Grigorova et al. (2012) wanted to detect the “teachers’ perceptions of their teaching and integration of constructivist approach in the classroom environment” (p. 186). They also wanted to know the “role of the science teachers as well as their relationship with students in the learning process” (p. 187). The survey that was used was administered in two forms, a teacher version and a student version. The reason for this was to compare the students’ views on the instruction the teachers gave and teachers’ views on how they instructed. This would determine how teachers performed as constructivist teachings. On the questionnaire Tafrova-Grigorova et al. (2012) were looking for information based on the methods of teaching and learning. The questions were broken down into two sections “the first group questions are related to the way of teaching [and] the second group questions required answers related to the way of learning of both the teachers and their students” (Tafrova-Grigorova et al., 2012, p. 187). Their interview of the six open-ended questions, revealed that the majority of the science teachers conducted their classroom using both methods of learning teacher-centered and student-centered classroom. This study was important because the CLES
survey was used in order to detect the teachers’ perceptions and integrations of the constructivist learning model as well as the learning classroom environment, which this thesis will try to establish by using the same instrument.

2.4.2 Survey Type Only

In Haney et al. (2003) investigations, they conducted a survey based on “the perceptions of teachers, administrators, parents, community members, and high school students about the science learning environment” (p. 366). The authors used a survey by Varrella and Burry-Stock’s (1997) *Beliefs about Learning Environments (BALE)* [this instrument] was used as a theoretical model for constructivist belief identification and comparison (Haney et al., 2003). Their participants consisted of seven districts; their minimum requirement was one administrator, three teachers, two parents, one community representative, and one high school student (Haney et al., 2003). In this case the research was based on one simple statement “My perception of the relationship between students and teachers in the learning environment is…” (Haney et al., 2003, p. 368). The Varrella and Burry-Stock’s BALE is based on “five characteristics” (p. 368) that Haney et al. (2003) were able to base their research on and that is “teaching for understanding, instructional approach, valuing the learner as an individual, questioning habits, and extensions of students’ thinking” (p. 368). As a result, the researchers found that:
Participants believe that a successful learning environment is one in which the teacher has a genuine ‘love’ or ‘enthusiasm’ for his/her profession, possesses adequate content knowledge, has the ability to motivate students to learn, is caring, is a good classroom manager, acts as facilitator or guide, is able to communicate (explain) knowledge, respects his/her students, provides students with multiple ways of learning, and provides a supportive environment for learning (Haney et al., 2003, p. 372).

These are the key components that all educators should possess whether they work in a K-12 school, City College or a four year university. By possessing these key factors as faculty members in a higher learning institute and projecting these components in their teacher education methods courses, they can not only teach pre-service teachers but model for them how to carry these same qualities into their own classrooms once they begin their teaching careers. These qualities also help facilitate having a positive and successful learning environment that every student needs in order to be successful in their learning and achieving their goals.

Finally, in the study by Shirvani (2009) the participants were 49 pre-service teachers enrolled in K-4 and K-8 programs in a college located in the southern region of the United States. The survey administered was the Constructivist Learning Environment Survey (CLES) (Taylor & Fraser, 1991; Shirvani, 2009). The survey was given as a pre-survey and post-survey to senior college students. This particular survey was conducted in order to find out if the faculty was able to maintain a constructivist approach in the classroom (Shirvani, 2009). This CLES survey includes six sections from the original survey and it was addressed to a mathematics course and the subscales consisted of "(1) Learning about the world, (2) Learning to communicate, (3) Learning to speak out, (4) How I feel, (5) Learning to learn, and (6) Learning
about math” (Shirvani, 2009, p. 249). The results in this study showed that in subscales one through four showed the most significant difference between the posttest survey and the pretest survey. Shirvani believes that this difference is due to students receiving activities that involved them to learn about the world around them, “they were actively engage in problem solving” (Shirvani, 2009, p. 252), they were able to express themselves freely, and they learned from each other.

However, in sections five and six, Shirvani (2009) had the least impact and it was the least significant to the pre-service teachers. This can be because they felt that they “were given the type of the assignment they should do; therefore, there was no input given by the students about determining which activities they did [and] learning about math the instructor did not refer to the history and culture of mathematics” (Shirvani, 2009, p. 253). This particular survey showed typically what many faculty members in colleges and universities across the country do in using constructivism as an approach to teaching pre-service teachers. Not everything a teacher does is considered a constructivist approach just because teachers use hands-on activities in everything they do (Hansen-Martin, 2002). This is why it is important that educators who teach pre-service teachers the constructivist approach of learning and its strategies that faculties are aware of all “of [the] other essential ingredients for the constructivist learning such as empowering students in classrooms by giving students the freedom of interacting with one another” (Shirvani, 2009, p. 253). Such perceptions like these can affect the pre-service teachers’ perception about constructivist learning theory as well as the effectiveness of using the strategies that come with the theory. Considering that constructivism is an important part of learning, especially in today’s schools and without that proper communication, classrooms in K-12 and
higher learning institutions will not have a conducive and constructivist learning environment that students and pre-service teachers need in order to move forward.

All of the studies mentioned have one thing in common: if pre-service teachers believe in themselves and believe in using constructivism as the approach of learning and motivating, pre-service teachers will have a voice; ownership in their curriculum, self-efficacy, consistency in their practice, positive attitudes, and motivation that will make pre-service teachers successful novice teachers as they fulfill their careers. A teacher’s belief is very important to how a teacher will teach their class. This is why it is important that pre-service teachers believe in constructivist learning approach in order to motivate their students to learn as well as to be an effective and efficient novice teacher once they are in their own classrooms. In addition, as pre-service teachers come into the field of education with beliefs that are negative or positive about constructivism as the best learning approach and motivating students to learn can affect and make an impact on their practice and actions in the classroom as well as effecting the success of educational reforms.

2.5 Overview

This chapter offers a summary on changes that are continuously being implemented in teacher education programs to better prepare pre-service teachers. By using tools and strategies that promote constructivist learning environments and having a student-centered classroom once they fulfill their careers. There was extensive coverage regarding the importance in using constructivism in teacher education programs and performance in teaching skills and constructivism.

In addition, after reviewing the extensive variety of methods to conduct research on classroom learning environments such as surveys, interviews, and questionnaires in additions to
the ones mentioned in this chapter, I have chosen to use the Constructivist Learning Environment Survey (CLES) (Taylor & Fraser, 1991; Shirvani, 2009). Because this survey supports researchers to review the level of constructivist epistemology in a classroom environment, assist teachers and pre-service teachers to ponder on their epistemological assumptions and restructure their teaching practices. For this reason, I chose Shirvani’s study as the framework for this research. It established how pre-service teachers see their mathematics methods courses and if faculty members were able to maintain and promote a constructivist epistemology classrooms. It also established a significant mean difference in areas that were most important in the author’s study in order to establish constructivist epistemology. It is outcomes like these that as a researcher I am hoping to generate, but in more than one subject area in the teacher education methods courses at UTEP. Chapter 3 will discuss the region’s demographics, participants, the research design, the instrument, and the data analysis.
Chapter 3: Methodology

3.1 Region Demographics

The participants in this research live within the surrounding areas of the El Paso County, where The University of Texas at El Paso (UTEP) is located. The community of El Paso has approximately a “population of 827,398 [with] 81.2% Hispanic/Latino(a), and White alone 92.4%, not Hispanic or Latino 13.7% of the population (U.S. Census website, 2013). El Paso is a self-contained region; it has a lower income than the average in the state of Texas. El Paso is a border city and it borders with Ciudad Juarez, Chihuahua, Mexico, from which many members of the community have migrated. It is a tightly-knit community with a sense of urgency when it comes to improving education, education reform and innovation. With these contributing factors both positive and negative, El Paso still struggles in graduation rates in all ethnicities (FSG, 2011). This is why it is important for pre-service teachers to be ready with the right tools to motivate and encourage students to learn.

Many of the students who begin college do so by attending “developmental coursework and their completing rate are six years” (NCES, 2011, Indicator 23, p. 72). The National Center for Education Statistics (NCES) (2011) states that the completion of a bachelor’s degree also varies by race/ethnicity such that “Asian/Pacific Islander students have the highest rate at (67 percent), followed by White students (60 percent), Hispanic students (49 percent), and Blacks (40 percent), and American Indian/Alaska Native students (38 percent each)” (NCES, 2011, Indicator 23, p. 72). UTEP enrolled 22,749 students in 2012 and the majority of the student population in this university is Hispanic with 77.39%, White 9.52%, African American 2.73%, Asian 0.90%, Native American 0.22%, Native Hawaiian or Other Pacific Islander 0.13%,
International 6.94 %, and Two or more races 0.43% (Center for Institutional Evaluation, Research, and Planning (CIERP), 2012).

3.2 The Participants

In the beginning, the anticipated participants were 318 pre-service teachers; however, by the time the fall semester began there were a total of 170 anticipated participants. This reduction was due to the lack of volunteers by faculty teaching teacher education methods courses, and as a result, only four faculty members had confirmed their participation. When the pre-survey was administered, only 130 surveys were collected. As a result, 40 participants were absent that week when the pre-survey took place this was in all six courses combined. When the post survey was administered, only 128 were collected, which left the research with an attrition rate of 1.53%. The two post surveys that were not collected from the participants were due to their absence during the survey administration and they were unable to be contacted.

The participants in this research were pre-service teachers from a local university, The University of Texas at El Paso. These students were in their senior year of their undergraduate program of Teacher Education. Their concentration programs are Early Childhood-6 (EC-6) elementary and 4-8 intermediate. The area of concentration for these pre-service teachers are 41.4% bilingual education, 29% generalist, 17.2% special education, 6.3% mathematics, 4% social studies, and 2.4% mathematics and science. The age of the participants ranged from 19 to 45 year old; there are 110 females and 18 males. The participants’ race/ethnicity are broken down as follows: Hispanic 86%; White 5.5%; African American 0%; Mexican 4.7%; and mixed race 7.1%. This information can also be found in a table with both numeric and percentage numbers in Appendix D. Pre-service teachers whom are generalists and special education will
take all subject area methods courses and those specializing in a particular subject will take only those method courses that correspond to their area of concentration.

3.3 **Institutional Review Board (IRB) Process**

The Institutional Review Board (IRB) process was lengthy considering that a certification was needed to be obtained in order to start the process of researching. It is crucial that all documents and requirements are met with the IRB office before starting your research. This research project received UTEP’s IRB approval (See Appendix C).

Participants were recruited by sending letters to all faculty members teaching the teacher education methods courses for the fall semester 2013. The letter explained the purpose of the research and the research questions to be investigated. It also explained the instrument that was going to be used and how often it was going to be administered throughout the semester (only twice during the semester). It was also explained that by participating it was on a volunteering basis.

There are eighteen sections in teacher education methods cohort courses with a total of 318 pre-service teachers. There are twelve faculty members (some are part-time faculty) teaching these courses. However, only four faculty members accepted to participate in the research and the survey was administered in these faculties’ classrooms. On the day that the survey was administered, the researcher presented to each of the pre-service teachers with the Informed Consent form. It was explained to them the purpose of the research, that participation was on a volunteer basis and that procedures would be taken to insure their confidentiality.

All completed pre-surveys and post surveys were entered into an excel document then converted into an SPSS document. None of the individuals were identified and confidentiality
was maintained. After the research has been concluded the researcher will appropriately follow UTEP and IRB protocols.

3.4 **Design of the Research**

This research design employed a quantitative method. The Constructivist Learning Environment Survey (CLES) (Taylor & Fraser, 1991) was chosen in order to assess the current teacher education methods courses at UTEP and to better understand the constructivist learning environment that is being promoted in teacher education. This research was based on the framework of Shirvani’s (2009) study on K-8 mathematics methodology class and its correspondence to constructivist epistemology. Shirvani’s (2009) study was administered at a university located south of the United States and only four minority students were part of the study. This research, however, was focused on teacher education methods courses in science, mathematics, and social studies. Also on how it corresponds to constructivist approach; the survey was administered in a university where the majority of the student population is Hispanic. The sections that were observed included science, social studies, bilingual education, special education and mathematics methodology courses. In these teacher education methods courses pre-service teachers gain, practice, and refine their pedagogical content knowledge (PCK) they need for the teaching of different subject areas in schools. The pre-service teachers learned inquiry-based and standard-based teaching methodologies as well as computer applications along with field experience.

3.5 **The Instrument**

The Constructivist Learning Environment Survey (CLES) was chosen for this thesis in order to investigate the constructivist teaching/learning approaches used by faculty members and to determine the degree of teacher education faculty members were able to employ a classroom
environment that encouraged a constructivist learning environment. Furthermore, to find out how pre-service teachers feel about some of their teacher education method courses. This instrument is also unique and universal when trying to measure a learning environment especially when you are measuring a particular classroom’s environment and its consistency with constructivist epistemology and in order for pre-service teachers and faculty to reflect and reshape their teaching practice (Haney et al., 2003; Klien, 2001; Plourde & Alawiye, 2003; Sahin, 2003; Shirvani, 2009; Taylor & Fraser, 1991; Tobin & Tippins, 1993; Van De Walle, 2007). This instrument was used because it is a standard, valid, and reliable tool for this type of research.

The CLES survey was administered to the pre-service teachers twice during the semester as a pre-survey and post survey. During the time that elapsed between surveys there were no interventions performed because this research was neither an experimental study nor a comparative study. The results of the survey were compared between the pre-survey and the post-survey. The research was intended to determine if the faculty member promoted a constructivist approach of learning and preserved a constructivist learning environment in the classroom. In addition, to comparing the pre-survey and the post survey it was also determined which subscales of the survey had the most significant mean difference whether it is higher or lower. Finally, it was determined which questions had the least or most significant difference in their responses.

Furthermore, using the CLES survey helped to measure the level of consistency in the kind of classroom learning environment that pre-service teachers were exposed to that encourages constructivism as an approach to learning. This type of survey provides researchers the ability to review the level of constructivist epistemology in a classroom environment and to assist teachers and pre-service teachers to reflect on their epistemological assumptions and
restructure their teaching practices. The diverse variation of this survey has become a widely used survey to determine the work of researchers who investigate constructivist teaching/learning approaches and the work of environmental researchers (Taylor & Fraser, 1991).

In addition to the variations of the survey, it has been used for measuring the understanding of constructivism in both students and teachers. It has been used on in-service teachers in K-12 as well as in higher learning institutes involving both students and faculty members in order to understand the teaching/learning practices. Researchers have made use of this instrument by making connections between students, classrooms, and teachers’ characteristics to students perceptions; it has been used to address pedagogical philosophies in secondary science teachers in Bulgarian schools; and finally it has served for studies on pre-service science teachers’ perceptions of their practicum classroom learning environments (Den Brok et al., 2006; Fazio & Volante, 2011; Shirvani, 2009; Tafrova-Grigorova et al., 2012). These different variations are just a few examples that the CLES has been used for in the past worldwide.

3.6 **The Data Analysis**

As part of the research, the SPSS statistical program, version 21, was used to analyze the data. If any of the sections of the survey show a significant mean difference, the SPSS was able to analyze which of the subscales and total subscales contained a significant difference. The SPSS was also used to perform several analyses that included frequencies of responses to the survey questions, means, standard deviations, validity and reliability. The paired t-tests were used in order to see if there was a significant difference between the means of the pre and post surveys by calculating it at the sub-scale level and at the total level. Furthermore, if any of the
sections that were analyze showed any kind of significant mean difference, the Wilcoxon Signed-rank test was able to examine which questions caused the mean difference in each of the sections of the survey. This data could be used as a base of how faculty preserved and encouraged a constructivist-learning environment in their classrooms.

3.7 Overview

This chapter described the methodology used in order to conduct this thesis project. It contained information regarding the regional demographics for the university where this research took place, and for its participants, the design of the study, the instrument used, and the data analysis. Chapter 4 will discuss the results of the research. See the Appendix for a copy of the CLES survey that was used in this research.
Chapter 4: Results

In this research the goal was to measure how faculty members at the Teacher Education Department at the University of Texas at El Paso employed a constructivist approach of learning and how pre-service teachers feel about the constructivist-learning model.

4.1 Analyzing the Pre-surveys and Post Surveys

Pre-service teachers were given the Constructivist Learning Environment Survey (CLES) (Taylor and Fraser, 1991) as a pre and post-survey. The pre-survey was administered six weeks into the semester. The post survey was administered six weeks after the pre-survey and it was only administered to four courses. The other two courses did not receive their post survey until eight weeks after the pre-survey due to curriculum conflicts, holiday school closures, and school cancelations due to the heating system being out. In these two courses, the survey was administered at the end of the semester during the last week of classes.

After analyzing and comparing both pre and post surveys it showed a small significant mean difference at the subscale level, but a major difference can been seen in the total scale of the research. In subscale four, learning to learn, the outcome showed a slight significant mean difference. This can mean that the faculty member might have given the students at one point or another, the opportunity to choose what activities to do, when to turn in an assignment, or maybe even how much time to spend on an activity or presentation. Even though this method is not considered constructivism, pre-service teachers may perceive this to be part of constructivism. Table 4.1 below shows the mean and standard deviation of the six subscales of the survey between the pre-survey and post survey. They are as follows: The mean of each subscale shows that the pre-survey’s mean is lower than the mean of the post survey, except in subscale five:
Learning to Communicate, where the difference was at a -0.01. It is slightly higher in the pre-survey.

Table 4.1: Level of Significance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre-Survey M</th>
<th>SD</th>
<th>Post Survey M</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning About the World</td>
<td>4.104</td>
<td>3.301</td>
<td>4.132</td>
<td>3.793</td>
<td>.000</td>
</tr>
<tr>
<td>Learning About Constructivism</td>
<td>3.798</td>
<td>4.897</td>
<td>3.954</td>
<td>4.751</td>
<td>.000</td>
</tr>
<tr>
<td>Learning to Speak Out</td>
<td>4.368</td>
<td>3.861</td>
<td>4.454</td>
<td>5.119</td>
<td>.000</td>
</tr>
<tr>
<td>Learning to Learn</td>
<td>3.226</td>
<td>6.415</td>
<td>3.58</td>
<td>6.113</td>
<td>.000</td>
</tr>
<tr>
<td>Learning to Communicate</td>
<td>4.738</td>
<td>2.384</td>
<td>4.726</td>
<td>2.964</td>
<td>.000</td>
</tr>
<tr>
<td>How I Feel</td>
<td>4.196</td>
<td>4.716</td>
<td>4.274</td>
<td>6.208</td>
<td>.000</td>
</tr>
<tr>
<td>Overall</td>
<td>4.071</td>
<td>18.252</td>
<td>4.186</td>
<td>20.964</td>
<td>.000</td>
</tr>
</tbody>
</table>

When comparing courses, the analysis showed that subscale four: Learning to Learn, had, the most significant difference. As a result, the most significant questions that made the most difference were numbers 16, 18, 19, 20, which are focused on how the student can assist the lecturer in planning the curriculum for the course. This difference can be seen on Table 4.1.1 showing the results of a T-Test. In addition, in Table 4.1.2, the results showed which questions were found to be the most significant for each of the subscales of the survey.
Table 4.1.1: Comparing Courses

<table>
<thead>
<tr>
<th>Pretest-Posttest Subscales</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>-.141</td>
<td>3.639</td>
<td>.322</td>
<td>-.777</td>
<td>.496</td>
<td>.437</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.663</td>
</tr>
<tr>
<td>Pair 2</td>
<td>-.781</td>
<td>4.619</td>
<td>.408</td>
<td>-1.589</td>
<td>.027</td>
<td>-1.913</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.058</td>
</tr>
<tr>
<td>Pair 3</td>
<td>-.430</td>
<td>4.728</td>
<td>.418</td>
<td>-1.257</td>
<td>.397</td>
<td>-1.028</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.306</td>
</tr>
<tr>
<td>Pair 4</td>
<td>-1.773</td>
<td>5.453</td>
<td>.482</td>
<td>-2.727</td>
<td>-.820</td>
<td>-3.679</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>Pair 5</td>
<td>.055</td>
<td>2.952</td>
<td>.261</td>
<td>-.462</td>
<td>.571</td>
<td>.210</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.834</td>
</tr>
<tr>
<td>Pair 6</td>
<td>-.383</td>
<td>5.095</td>
<td>.450</td>
<td>-1.274</td>
<td>.508</td>
<td>-.850</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.397</td>
</tr>
<tr>
<td>Pair 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.773</td>
<td>-2.550</td>
<td>127</td>
</tr>
</tbody>
</table>

*Note: Pair 1 Learning About the World, Pair 2 Learning About Constructivism, Pair 3 Learning to Speak Out, Pair 4 Learning to Learn, Pair 5 Learning to Communicate, Pair 6 How I Feel, and Pair 7 Overall.*
Table 4.1.2: Most Significant Questions

<table>
<thead>
<tr>
<th>Questions#</th>
<th>Learning about the World</th>
<th>Learning about Constructivist</th>
<th>Learning to Speak Out</th>
<th>Learning to Learn</th>
<th>Learning to Communicate</th>
<th>How I Feel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>7. I learn how constructivist learning strategies are influenced by people's values and opinions</td>
<td>8. I learn about the different constructivist strategies used by people in other cultures</td>
<td>11. Its ok for me to ask the lecturer &quot;why do I have to learn this?&quot;</td>
<td>16. I help the lecturer to plan what I'm going to learn</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18. I help the lecturer to decide which activities are best for me</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19. I help the lecturer to decide how much time I spent on activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20. I help the lecturer to decide which activities I do</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

| P          |                          |                               |                       |                   |                       |            |
| 0.028      |                          |                               |                       |                   |                       |            |
| 0.016      |                          |                               |                       |                   |                       |            |
| 0.004      |                          |                               |                       |                   |                       |            |

4.2 Subscales’ Significant Changes

4.2.1 Learning about the World

This subscale is about connecting the classroom-learning environment to the world outside. Throughout the semester students were taught different ways of how to teach their subject area in a variety of ways. They were given many examples of how to apply the different strategies using real world examples in order for the students to make that connection between the classroom activities and the outside world. This subscale showed that there was no significant change in pre-service teachers’ responses between the pre-survey and post survey,
which can mean that students were able to make the connections that were taught in class to the outside world.

4.2.2 Learning about Constructivism

The course objectives in all six methods courses did not address any of the questions relating to this particular section of the survey. In this subscale of the survey, the following statements were addressed: “(6) I learn how constructivist learning strategies have changed over time, (7) I learn how constructivist learning strategies are influenced by people's values and opinions, (8) I learn about the different constructivist strategies used by people in other cultures, (9) I learn how modern constructivism is different from the traditional teachings of long ago, and (10) I learn how constructivist learning strategies involves inventing rules” (Taylor and Fraser, 1991; Shirvani, 2009, p. 251). Of all these statements only two had a very minimal change and those are 7 and 8 as seen on Table 4.1.2. This showed that students were able to understand that people’s values and opinions can influence how constructivism is taught in the classroom. They also learned how other cultures implement constructivism in their classrooms.

4.2.3 Learning to Speak Out

In learning to speak out the subscale showed that question 11 “It’s ok for me to ask the lecturer “why do I have to learn this” (Taylor and Fraser, 1991; Shirvani, 2009, p. 251) was the only one to have minimal significance. This means that students had the confidence to speak up and express their opinions with no reservations.

4.2.4 Learning to Learn

The survey focused on students making decisions about what they will learn in the classroom. This particular section included statements like: “(16) I help the lecturer to plan what I’m going to learn, (17) I help the lecturer to decide how well I’m learning, (18) I help the
lecturer to decide which activities are best for me, (19) I help the lecturer to decide how much time I spent on activities, and (20) I help the lecturer to decided which activities I do (Taylor and Fraser, 1991; Shirvani, 2009, p. 251). Because students are not involved in the planning and creating of the syllabus students do not get to choose what they learn in class, unless modifications are made and the faculty member may offer and/or give students the option of choosing what activities to do in exchange for assignments depending on the situation. Even then, the significant difference was not a major one; however, it was the subscale with the most difference. As you can see in Table 4.2, all teacher education methods courses showed that they were able to maintain a constructivist learning environment throughout the semester, but only course two showed the most significant difference and yet still the results were very close to each other.

Table 4.2: Course Comparisons

![Graph showing estimated marginal means of posttest subscale four score across courses.]

Countiates appearing in the model are evaluated at the following values: Pretest-Subscale Four Score = 16.13
4.2.5 Learning to Communicate

Here the students are allowed to communicate among themselves freely up to a certain extent. In this project it showed that there was no significant difference in pre-service teachers’ responses on questions 21-25. Due to the fact that all faculty members require that their students work in groups on lesson planning, projects, discussions, and presentations which allowed students to socially interact with each other. This also encourages a positive classroom learning environment. As part of working together and interacting with one another it is a significant element of constructivist learning. In all courses, the students were continuously encouraged to share their outcomes, reflections, and perceptions.

4.3 Overview

In conclusion, the findings showed that when students evaluate whether or not teacher education faculty members were able to maintain a classroom environment that encouraged a constructivist learning environment it showed minimal significant mean difference. This tells us that pre-service teachers gave responses that were candid and truthful to what they saw and felt at the time the survey was administered. Also, because it was not taken into account how much knowledge the participants’ had about constructivism they may not have known what to look for. Furthermore, by having a larger significant difference can show that pre-service teachers saw a major difference in teaching strategies, different teaching approaches that each faculty member provided/brought into their classrooms. It would have shown a learning growth between the post survey and the pre-survey responses.

In addition, considering that the most significant mean difference was shown in subscale 4, and even then, subscale 4 dealt with assisting the faculty member with the planning and creating a curriculum suitable for the classroom. Yet, students are not involved in this process.
The findings also showed that throughout the semester faculty members used a variety of strategies to assess students’ performance. Such strategies included quizzes, essays, group presentation/projects, portfolios, interactive notebook entries, lab activities, discussions, final individual projects/exams, creation of lesson plans and reflections. Grades were also attained at the end of the semester and it showed that pre-services teachers were able to maintain good academic standings as required by the teacher education program.

The majority of the participants had the same two faculty members whether it was, faculty 1 and 2 or faculty 1 and 3, for at least two of their content areas. And even though students were evaluating two different faculty members in two different content areas there was very little significant difference in how students learned. Because the findings showed no significant mean difference, one can conclude two outcomes: 1) that faculty members were able to maintain a classroom environment that promoted constructivism by teaching in their own unique way and in how they used their constructivism approach of learning. In addition, it gave pre-service teachers the opportunity to establish how they felt about their teacher education methodology courses; or 2) that faculty members were unable to maintain a classroom environment that promoted constructivism and pre-service teachers were unable to see the difference between a traditional classroom environment that implements a teacher-centered environment compared to a constructivist learning environment that implements and focuses on student-centered learning environment.

Since the possible outcomes are opposites from each other, we learned that pre-service teachers were unable to determine either way what constitutes constructivism or a constructivist learning environment. They were unable to see the difference in techniques between faculty members and between methods courses. This survey was helpful in a way in which it facilitated
to understand how much did pre-service teachers know about constructivism and its constructivist learning environment.
Chapter 5: Discussion

The purpose of the research was to determine if faculty members in the Teacher Education Department at UTEP preserved a classroom environment that promotes a constructivist learning approach and how pre-service teachers feel about their teacher education methods courses in the fields of science, mathematics, and social studies.

5.1 Research Questions

The following are the research questions this research attempted to answer:

- Do faculty in teacher education programs in the areas of science, mathematics, and social studies in the UTEP College of Education maintain and promote a constructivist classroom-learning environment?

According to the results of the pre-survey and post-survey it showed a minimal significant mean difference between the surveys. The most difference came from subscale 4, learning to learn, with a mean difference of 0.36, where the post survey had gain a significant difference. This outcome can be justified that faculty members were able to maintain and promote a constructivist classroom-learning environment. Because there was no major difference at the subscale level, however, it is shown at the total scale level. The justification for these results would be due to the slight gain in five subscales, except in one subscale, learning to communicate. In subscale 5 there was a loose in significance by -0.01. These minimal gains and losses can only determine that they did maintained and promoted a constructivist-learning environment. Faculty members were able to project encouragement and excitement onto their students as well as motivating them to learn. These faculty members also showed a positive rapport with their pre-service teachers and vice versa. They used strategies like individual and group presentations/projects, lab activities, discussions
reflections, interactive notebook entries, portfolios, and implemented a variety of forms of assessments.

- How do pre-service teachers feel about the constructivist-learning model?

The results show that there was a minimal significant mean difference between both surveys. This could mean two possibilities: 1) pre-service teachers learned in an environment that employed and promoted the constructivist learning environment; or 2) pre-service teachers were unaware of what really constitutes constructivism and many times constructivism is perceived as having any activity that involves hands-on and this is not necessarily the case as stated by Martin-Hansen, (2002). Also, because the research did not take into account if pre-service teachers had enough knowledge and background about what constitutes constructivism. In this case, due to the constructivist-learning model implemented by faculty members, pre-service teachers learned how constructivism could be a part of life outside college. They learned about the different constructivist teaching strategies, and how they could be implemented, and they showed this through lesson planning, and individual or group presentations/projects, just to name a few. It also showed that the students were happy with their courses, they felt less stressed, and they look forward to attending their courses. Faculty members were able to project a positive and enthusiastic attitude towards their content curriculum, which in turn stimulated the student’s learning and the environment. Pre-service teachers commented that they felt the tools and learning strategies used in their teacher education methods courses were very helpful both academically and professionally. Many of the students made positive comments about their methods courses and about their faculty members. Overall, they gained knowledge and skills that they did not have before and now they can move forward and feel more confident in teaching in an environment that encourages and promotes constructivism as an approach to learning.
5.2 **MAIN FINDINGS**

In order to determine these results, the Constructivist Learning Environment Survey (CLES) (Taylor & Fraser, 1991) was used to explore this research. The survey had six sections that included (1) learning about the world, (2) learning about constructivism, (3) learning to speak out, (4) learning to learn, (5) learning to communicate, and (6) how I feel.

5.2.1 **Subscale 1: Learning About the World**

Learning about the world showed that there was a slightly significant gain. This means that students were learning to solve problems and relate them to the outside world. Also, the activities that were performed in the classroom use contextual problems which made it possible for students to relate it to their personal experiences as well.

5.2.2 **Subscale 2: Learning About Constructivism**

Learning about constructivism dealt with questions about the history of constructivism, how it had changed overtime, what are people’s values and opinions, the difference between modern and traditional constructivism, and the use of constructivism in other cultures. Because it was not part of the course objectives this outcome could be the reason why there was minimal or no significant difference in the responses between the pre-survey and the post survey. As stated before it can mean that because many pre-service teachers might be unaware of what really constitutes constructivism and many times constructivism is perceived that if a hands-on activity is used it is considered using constructivism and when in fact this is not so (Hansen-Martin, 2002). Shirvani (2009) stated that “the essential ingredients for the constructivist learning such as empowering students in [the] classrooms [is] by giving students the freedom of interacting with one another” (p. 253). That is why it is important that educators who teach pre-service teachers the constructivist approach of learning and its strategies that faculties are aware how much
knowledge do these pre-service teachers have on constructivism as an approach of learning. If a pre-service teacher is not fully aware of what constitutes constructivism they may not be aware that constructivism is being used and that they are learning the constructivist learning approach of teaching. Piaget (1983) perceives constructivism as a mechanism of assimilation, accommodation and equilibrium. Therefore, if pre-service teachers do not know what constitutes constructivism the pre-service teacher is just assimilating what the faculty member is teaching and what is being asked of the student. This can be the reason why there was no change or growth in subscale 6, which was one of the most important subscales regarding learning about constructivism.

5.2.3 Subscale 3: Learning to Speak Out

Learning to speak out also showed a slight higher mean, but insignificant in mean difference on the post survey. This can definitely be because all faculties encouraged their students to speak up if they had any concerns or misconceptions about any of the materials that were being provided including lectures, activities, projects, creating lesson plans or on any exams. It also means that faculty members were able to maintain a positive learning environment in which students could feel comfortable to express their opinions and ask questions when students felt that the material was hard to understand.

5.2.4 Subscale 4: Learning to Learn

Learning to learn was the subscale that showed the most significance gain in mean difference and a much higher mean on the post survey than the pre-survey as compared to the ratings in the other subscales. The reason for this gain could be because faculty may have offered and/or given students the option of choosing what activities to do in exchange for an assignment or even volunteering in community events depending on the situation and the kind of
modifications that the faculty member may have offered. Teacher’s behaviors can have a significant effect on classroom learning environments and two essentials strategies are the proper use of class time and instruction that is planned and adaptive (Willms, 2010). Also effective curriculum that requires students to take a fundamental set of academically oriented classes; the content and pace of the curriculum can also play a key role in the learning environment of a classroom (Willms, 2010). This subscale showed the most significance when comparing courses as you can see on Table 4.1.1 and Table 4.1.2.

In addition, the major difference can be due to the different strategies used by all four different faculty members and also because it consisted of three difference methodology courses in three different areas of concentration. Strategies used in a social studies course will be very different compared to mathematics and science. This poses a limited amount of strategies used and the style of teaching that each faculty member has.

5.2.5 Subscale 5: Learning to Communicate

Learning to communicate was one of the sections that had a slightly lower mean in the post survey and higher in the pre-survey. This can mean that students might have been less actively engaged in problem-solving activities, were not encouraged enough to discuss their findings in and among their learning groups, or perhaps students may have discussed their findings, but then carried other discussions not related to the classroom activity or assignment. As stated in the literature review it is crucial that faculty members have a positive rapport with their pre-service teachers and vice versa in order to keep the lines of communication open.

5.2.6 Subscale 6: How I Feel

How I feel was one of the other subscales that had a slightly higher mean difference in the post survey. When the surveys were administered there were no intervention strategies
between the two surveys. No changes were made in the classroom or the curriculum because the research was neither an experimental study nor a comparative study. Here pre-service teachers were given the opportunity to express their feelings and comment about their teacher education methods courses and they all expressed the same perceptions. The results also showed that the students enjoy taking these courses. They were happy with their teacher education methods courses, they felt less stressed, and they enjoyed taking the courses. They learned a lot from the hands-on activities and from their reflection writings. Many pre-service teachers felt that the courses changed their perception about the subject matter and have a positive perspective about science, mathematics, and social studies. One student mentioned that “they hated history and now they see history as a gateway to her future, has a much better understanding and appreciation, and has a positive perception and attitude about history.”

5.3 Reliability and Validity

The reliability of the data collected was tested several times in the same several forms using ANOVA, T-Test, and Wilcoxon Signed-ranked Test and in all forms the same results were found each time. The equivalency reliability between the pre-survey and post survey determined the relationship and strength of the correlation between the two. Stability reliability was also measured by testing and re-testing the same subjects, the results were compared and correlated with the initial test and gave a stability measurement. The data that were assessed gave repeated characteristics and qualities that made it possible to interpret the data and predict the value of how pre-service teachers felt about their methods courses and if faculty members maintained a constructivist learning environment.

The validity of the data was also tested in order to determine its validity. The validity of the research accurately reflects the specific concepts that this research was intended to examine
and as a result the measuring of faculty member’s ability to maintain a constructivist learning environment and how pre-service teacher felt about their methodology courses proved to be accurate.

5.4 **LIMITATIONS**

Some of the limitations encountered include:

- The ability to get a much larger sample size and having more methods courses/faculty members volunteer to participate in studies such as this one.
- Responses to the survey questions from the participants were at face value and it can be assumed that their responses were candid and truthful.
- Furthermore, the research did not take into account if pre-service teachers had enough knowledge and background about what constitutes constructivism and what to look for when the surveys were conducted.

5.5 **RECOMMENDATIONS FOR FUTURE STUDIES**

- Collect a much larger sample size by recruiting faculty members to volunteer and participate in studies like this one. Faculty members should be contacted at least a semester ahead of time and talk to faculty on a one to one basis.
- Continue the research in a yearlong study in order to collect data that may contribute to a better understanding of constructivism as a learning theory and as an approach to learning strategy.
- Provide the CLES survey to faculty members and not only to pre-service teachers as it was done on this research. By giving the survey to faculty members, they can have an opportunity to reflect on their teachings and analyze their curriculum. Faculty members
will be able to rate themselves and see how they teach these constructivist-learning approaches.

- Administer the pre-survey and post surveys during the first day or week of the classes and during the last day or week of classes as well. This will give a nice range between surveys and pre-service teachers and faculty members will be able to reflect more on the statements and answer these statements with more caution.

- Implementing a questionnaire would be beneficial because the researcher can use this questionnaire as an interview tool for both pre-service teachers and faculty members. This can benefit by getting a deeper sense of understanding of what they think and feel. It can help understand and measure how both students and faculty feel about the constructivist-learning model.

5.6 CONCLUSION

Overall, this research has proved that by in using constructivism as an approach to learning and motivating, pre-service teachers at UTEP will benefit from its theory and learning/teaching strategies. Pre-service teachers will have ownership in their curriculum, self-efficacy, and consistency in their practice, positive attitudes, and motivation that will make pre-service teachers successful novice teachers as they fulfill their careers.

In addition, the instrument used helped to determine whether or not faculty members maintained a constructivist classroom learning environment and how pre-service teachers felt about the constructivist model. The instrument proved to be reliable and valid. In this research, the data collected were put through a series of tests. This instrument has also been used in numerous research studies; it has assisted educators to reflect on their own perceptions and assumptions, as well as reshaping their teaching strategies. It was created for the use of K-12 and
for higher education institutes; investigations in constructivism teachings/learning approaches, constructivist-learning environments; and the understanding of constructivism in both students and teachers (Taylor & Fraser, 1991). These and many other variations of this same instrument had been used and had been proven to be reliable and had validity (Den Brok et al., 2006; Fazio & Volante, 2011; Taylor & Fraser, 1991; Tafrova-Grigorova et al., 2012; Shirvani, 2009).

Furthermore, it is important that pre-service teachers must have the proper tools, a concrete knowledge of constructivism, the proper skills to use constructivist learning strategies, and most importantly that pre-service teachers believe in the theory and in its methods. Because this research did not take into account if the pre-service teachers had enough knowledge and background about what constitutes constructivism and what to look for when the survey was conducted, maybe they did not know what to look for. It is only an assumption that I can assume and possibly justify why there was not a major significance in mean difference between the pre-survey and the post-survey. It is definitely undeniable that the quality of the classroom environment is the most noteworthy influence of student learning. The research proved that by having a stress-free environment students can learn and perform better as well as have a positive point of view towards curriculum being taught.

It is crucial that pre-service teachers at UTEP learn to read deeply and widely in order to learn and gain that deep understanding they need in order to have a positive and confident attitude towards constructivism especially in such a competitive field in today’s-day-and-age. When pre-service teachers assert the theoretical structure of constructivism, then, UTEP’s College of Education has effectively given quality instruction to the student teachers. Therefore, if the pre-service teachers are more knowledgeable and skilled they are more likely to apply the constructivist approach of learning to teach.
References


61


Appendix A

The Constructivist Learning Environment Survey (CLES)

Directions

Please provide details in the box below.

a. Identifiers: __________________________
b. Professor’s Name: _______________________
c. Course: __________________________
d. Area of Concentration: _______________________
e. Gender: __________________________
f. Race/Ethnicity: __________________________
g. Age: __________

1. Purpose of the Questionnaire

This questionnaire asks you to describe important aspects of your science classroom. There is no right or wrong answer. This is not a test and your answers will not affect your assessment. Your opinion is what is wanted. Your answers will enable us to improve future science classes.

2. How to Answer Each Question

On the next few pages, you will find 30 sentences. For each sentence, mark an X on only one number corresponding to your answer. For example:

<table>
<thead>
<tr>
<th>In this Teacher Education class…</th>
<th>Almost Always 5</th>
<th>Often Agree 4</th>
<th>Sometimes 3</th>
<th>Seldom Agree 2</th>
<th>Almost Never Agree 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 The teacher asks me questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- If you think your science teacher almost always asks you questions, mark an X on the 5.
- If you think your science teacher almost never asks you questions, mark an X on the 1.
- Or you can choose the number 2, 3 or 4 if one of these seems like a more accurate answer.

3. How to Change Your Answer

If you want to change your answer, cross it out and mark a new number. For example:

| 8 The teacher asks me questions. | 5 |  |  | 2 | 1 |

4. Completing the Questionnaire

Now turn the page and please give an answer for every question.
<table>
<thead>
<tr>
<th>Learning about the world</th>
<th>Almost Always</th>
<th>Often Agree</th>
<th>Sometimes Agree</th>
<th>Seldom Agree</th>
<th>Almost Never Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this Teacher Education class...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I learn about the school world outside college</td>
<td></td>
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</tr>
<tr>
<td>2. My new learning starts with problems about the school world outside college</td>
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</tr>
<tr>
<td>3. I learn how constructivism can be part of my out-of-college life</td>
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<td></td>
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</tr>
<tr>
<td>4. I get a better understanding of the school world outside college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I learn interesting things about the school world outside college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning about constructivist learning strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In this Teacher Education class…</td>
<td></td>
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<td></td>
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<tr>
<td>6. I learn how constructivist learning strategies have changed over time</td>
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<tr>
<td>7. I learn how constructivist learning strategies are influenced by people's values and opinions</td>
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<tr>
<td>8. I learn about the different constructivist strategies used by people in other cultures</td>
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<tr>
<td>9. I learn how modern constructivism is different from the traditional teachings of long ago</td>
<td></td>
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<tr>
<td>10. I learn how constructivist learning strategies involves inventing rules</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning to speak out</td>
<td>Almost Always</td>
<td>Often Agree</td>
<td>Sometimes Agree</td>
<td>Seldom Agree</td>
<td>Almost Never Agree</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>--------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>In this Teacher Education class…</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. Its ok for me to ask the lecturer &quot;why do I have to learn this?&quot;</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. It's ok for me to question the way I'm being taught</td>
<td></td>
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<tr>
<td>13. It's ok for me to seek clarification about activities that are confusing</td>
<td></td>
<td></td>
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<tr>
<td>14. It's ok for me to question anything that will express my opinion</td>
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</tr>
<tr>
<td>15. It's ok for me to express my opinion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning to learn</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In this Teacher Education class…</td>
<td></td>
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</tr>
<tr>
<td>16. I help the lecturer to plan what I'm going to learn</td>
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<tr>
<td>17. I help the lecturer to decide how well I am learning</td>
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<tr>
<td>18. I help the lecturer to decide which activities are best for me</td>
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<tr>
<td>19. I help the lecturer to decide how much time I spent on activities</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20. I help the lecturer to decide which activities I do</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning to communicate</td>
<td>Almost Always</td>
<td>Often Agree</td>
<td>Sometimes Agree</td>
<td>Seldom Agree</td>
<td>Almost Never Agree</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>------------------</td>
<td>--------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>In this Teacher Education class…</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>21. I get the chance to talk to other students</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>22. I talk with other students about how to solve problems</td>
<td></td>
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<tr>
<td>23. I explain my ideas to other students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I ask other students to explain their ideas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Other students ask me to explain my ideas</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**How I feel**

| In this Teacher Education class… | | | | | |
| 26. I look forward to this class | | | | | |
| 27. This is one of the most interesting classes at college | | | | | |
| 28. I enjoyed this class | | | | | |
| 29. I feel less stressed in this class | | | | | |
| 30. I feel less confused in this class | | | | | |
Appendix B

University of Texas at El Paso (UTEP) Institutional Review Board
Informed Consent Form for Research Involving Human Subjects

Protocol Title: Understanding the Constructivist Learning Environment in Teacher Education Methodology Courses at UTEP
Principal Investigator: Veronica Jackson
UTEP: Teacher Education Department

1. Introduction

In this consent form, “you” always means the study subject. If you are a legally authorized representative (such as a parent or guardian), please remember that “you” refers to the study subject.

You are being asked to take part voluntarily in the research project described below. Please take your time making a decision and feel free to discuss it with your friends and family. Before agreeing to take part in this research study, it is important that you read the consent form that describes the study. Please ask the study researcher or the study staff to explain any words or information that you do not clearly understand.

2. Why is this study being done?

You are being asked to be in the study because you are a pre-service elementary or an intermediate teacher in the Teacher Education Program.

Approximately, 318 pre-service elementary and intermediate teachers will be enrolling in teacher education methodology courses in which this study will take place at UTEP.

3. What is involved in the study?

If you decide to enroll in this study, your involvement will last about one day during the middle of the semester and a second day at the end of the semester for a pre survey and post survey.

4. What are the risks and discomforts of the study?

At this time there is no foreseeable risk, but loss of confidentiality may be possible. The principal investigator is taking all necessary precautions, see sections A and B.
A. For those participants who volunteer will receive the informed consent on the day that the pre survey will be performed, before receiving the pre survey.

B. Once the informed consents and the surveys have been received, the data will be place in legal size envelopes along with their post survey package. The personal information on the survey will only consist of the package tracking number, professor’s name, and area of concentration, gender, age, and ethnic background. The data collected will be in the principal investigators possess at all times. The data will be entered into the computer and saved in a USB devise and paper-based data will be stored in a filing cabinet. Both paper-based and USB will be stored together at all times under lock and key. Each participant will receive a package tracking number in order for the participant to receive the same package for the post survey.

5. What will happen if I am injured in this study?

The University of Texas at El Paso and its affiliates do not offer to pay for or cover the cost of medical treatment for research related illness or injury. No funds have been set aside to pay or reimburse you in the event of such injury or illness. You will not give up any of your legal rights by signing this consent form. You should report any such injury to Veronica Jackson at vjackson@miners.utep.edu and to the UTEP Institutional Review Board (IRB) at (915-747-8841) or irb.orsp@utep.edu.

6. Are there benefits to taking part in this study?

There will be no direct benefits to you for taking part in this study. This research may help us to understand how professors in teacher education programs maintain and promote a constructivist classroom learning environment; how do pre-service teachers feel about the constructivist classroom learning environment; and finally how will the results of this study compare to those of Shirvani’s (2009) study where there was only four minority participants versus the majority of the participants are minority.

7. What other options are there?

You have the option not to take part in this study. There will be no penalties involved if you choose not to take part in this study.

8. Who is paying for this study?

The principal investigator is not receiving any investigative moneys.
9. What are my costs?

There are no direct costs. You will be responsible for travel to and from the research site and any other incidental expenses.

10. Will I be paid to participate in this study?

You will not be paid for taking part in this research study.

11. What if I want to withdraw, or am asked to withdraw from this study?

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you do not take part in the study, there will be no penalty.

If you choose to take part, you have the right to stop at any time. However, we encourage you to talk to a member of the research group so that they know why you are leaving the study. If there are any new findings during the study that may affect whether you want to continue to take part, you will be told about them.

The researcher may decide to stop your participation without your permission, if he or she thinks that being in the study may cause you harm, or if you decide to change your designation as a pre-service elementary and/or intermediate teacher.

12. Who do I call if I have questions or problems?

You may ask any questions you have now. If you have questions later, you may contact the principal investigator at email: vjackson@miners.utep.edu

13. What about confidentiality?

1. Your part in this study is confidential. None of the information will identify you by name. All records will be maintained by a number system in which it will help keep track of the number of surveys being issued and returned. Data will be reported in aggregated and the principal investigator will insure to maintain privacy and confidentiality by restricting access of gathered data. Once data has been analyzed all data will be destroyed.
14. Authorization Statement

I have read each page of this paper about the study (or it was read to me). I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study without penalty. I will get a copy of this consent form now and can get information on results of the study later if I wish.

Participant Name: ___________________________ Date: __________

Participant Signature: ___________________________ Time: __________

Consent form explained/witnessed by: ___________________________

Principal Investigator Signature

Printed name: Veronica Jackson

Date: _______________ Time: _______________
Appendix C

THE UNIVERSITY OF TEXAS AT EL PASO
Office of the Vice President for Research and Sponsored Projects
Institutional Review Board
El Paso, Texas 79968-0587
phone: 915 747-8841  fax: 915 747-5931
FWA No: 00001224

DATE: August 26, 2013
TO: Veronica Jackson, BIS
FROM: University of Texas at El Paso IRB
STUDY TITLE: [503336-1] Understanding The Constructivist Learning Environment on Teacher Education Methodology Courses at UTEP
IRB REFERENCE #: 503336-1
SUBMISSION TYPE: New Project
ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: August 26, 2013

Thank you for your submission of New Project materials for this research study. University of Texas at El Paso IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulation 45 CFR 46.101(b)(2).

Exempt protocols do not need to be renewed. Please note that it is the Principal Investigator’s responsibility to resubmit the proposal for review if there are any modifications made to the originally submitted proposal. This review is required in order to determine if "Exemption" status remains.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact Athena Fester at (915) 747-8841 or afester@utep.edu. Please include your study title and reference number in all correspondence with this office.

cc:
### Appendix D

#### Composition of Participants

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Race</th>
<th>Area of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 – 45 years old</td>
<td>110 Females (86%)</td>
<td>110 Hispanic (86%)</td>
<td>53 Bilingual Education (41.4%)</td>
</tr>
<tr>
<td></td>
<td>18 Males (14.2%)</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 White (5.5%)</td>
<td>37</td>
<td>Generalists (29%)</td>
</tr>
<tr>
<td></td>
<td>0 African American (0%)</td>
<td>22</td>
<td>Special Education (17.2%)</td>
</tr>
<tr>
<td></td>
<td>3 Mexican (4.7%)</td>
<td>8</td>
<td>Mathematics (6.3%)</td>
</tr>
<tr>
<td></td>
<td>9 Mixed Race (7.1%)</td>
<td>5</td>
<td>Social Studies (4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Mathematics/Science (2.4%)</td>
</tr>
</tbody>
</table>
Vita

Veronica Jackson was born and raised in El Paso, Texas. The daughter of Rosa Maria Garcia and Santos M. Garcia, she graduated in 1991 from El Paso High School. After high school she attended El Paso Community College (EPCC) on and off throughout the years. In 2007 she returned to school as a fulltime student at the University of Texas at El Paso (UTEP) and concurrently with EPCC in order to fulfill her education career. She graduated from EPCC in 2009 with an Associate of Arts degree. In 2011 she received her Bachelors in Interdisciplinary Studies from UTEP. In the fall of 2011 she started her graduate program to pursue a degree in Master of Arts. She will continue her education until she reaches to receive a Teaching, Learning and Culture (PhD) degree.

Permanent address: 3920 Taurus Court
El Paso, Texas 79904

This thesis/dissertation was typed by Veronica Jackson.