RELATIONSHIP OF TEACHER EDUCATORS EPISTEMOLOGICAL BELIEFS AND INSTRUCTIONAL BELIEFS WITH INSTRUCTIONAL PRACTICES: AN ANALYTICAL STUDY

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Relationship of Teacher Educators Epistemological Beliefs and Instructional Beliefs with Instructional Practices: An Analytical Study

By

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Submitted in partial fulfillment of the requirements for the Degree of Philosophy in Education at the Faculty of Social Sciences, International Islamic University, Islamabad

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DEDICATED

To my

Grandfather, Grandmother
and Parents
Who suffered but enabled me to get the highest Degree

APPROVAL SHEET

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It is certified that the contents and format of the thesis titled "Relationship of Teacher Educators' Epistemological Beliefs and Instruction Beliefs with Instructional Practices: An Analytical Study" submitted by Itbar Khan, Registration No: 111-FSS/PHDEDU/F13 has been found satisfactory for the requirements of the degree of Doctor of Philosophy in Education.

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ABSTRACT

Teachers' epistemological and instructional beliefs play vital role in classroom practices and curriculum implementation. This study examined the 'Relationship of Teacher Educators' Epistemological and Instructional Beliefs with Instructional Practices'. The objectives of this study were to measure the epistemological beliefs of teacher educators; to find out the instructional beliefs of teacher educators; to find out the instructional practices of teacher educators; to measure the relationship between epistemological beliefs and instructional beliefs of teacher educators; to measure the relationship between epistemological beliefs and instructional practices of teacher educators, to examine the relationship between instructional beliefs and instructional practices and to find out difference in the observed and self-reported instructional practices of teacher educators in teachers' education institutions. This was a correlational study. The population of the study consisted of 211 teacher educators from Regional Institutes of Teacher Education (RITEs) and University faculty at the 09Institutes of Education and Research (IERs) in Khyber Pakhtunkhwa (KP). Data were collected from 140 teacher educators, they were selected through stratified random sampling technique at 20 RITEs and University faculty at the 09 IERs, KP Pakistan. Moreover, 34 teacher educators were randomly selected for classroom observation. Data were collected through Epistemological Beliefs Questionnaire (EBQ), Instructional Beliefs Questionnaire (IBQ), Instructional Practices Questionnaire (IPQ) and classroom observation scale. Descriptive statistics like mean standard deviation and inferential statistics, Pearson r, pair t-test were calculated for finding answers to the research objectives. The study found significant positive correlation between EB and IB; there was also positive correlation between IB and IP and there was positive and significant correlation between instructional practices and instructional beliefs. Teacher educators had low sophisticated beliefs; their beliefs about some of the dimensions of knowledge were unsophisticated. They believed in high constructivist beliefs and low level traditional instructional beliefs. There was found no significant difference in the self- reported and observed traditional instructional practices while there was significant difference in the self-reported and observed constructivist instructional practices. The study added to the knowledge on epistemological beliefs about teacher educators. The study recommends training for teacher educators in epistemological beliefs, instructional beliefs, constructivist classroom practices and consideration for the beliefs of teachers when developing a new curriculum.

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CHAPTER 1

INTRODUCTION

Teachers are the most important elements in educational reforms and at the same time the biggest hurdles in the way of implementation of reforms in education (Prawat, 1992). The pre-existing beliefs of teachers hinder the true implementation of curriculum when they are not in congruence with the basic philosophy of curriculum (Cronin-Jones, 1991). Beliefs about knowledge and learning have a significant influence on learning, and enhancing understanding of this process can make teaching more effective (Hopper, 2004). Pintrich (1990) also gives much importance to teachers' beliefs in teacher education. Similarly, Fluck and Dowden (2010) opine that beliefs of teachers play vital role in the application of new instructional methods and techniques in classrooms and bringing change in schools. According to Prawat (1992), teachers stick to their traditional beliefs. Bryan (2012) is of the view that there would be issues in the implementation of the reform when beliefs of teachers are not in line with the philosophical foundations of the reform.

Fullen (2007) says that innovation is multi-dimensional. There are three elements at stake in curriculum innovation: the possible use of new instructional material, the possible use of new instructional approaches, and possible changes in the beliefs of teachers.

Teachers are important actors in the implementation of curriculum, innovations and policy. They implement changes according to their beliefs and the context in which they work (Spillane, Reiser & Remer, 2002; Woods, 1996). Implementation of reforms in education needs teachers to change their behaviors and beliefs about the teaching

process. Changes in education can become effective when teachers bring necessary conceptual changes in their approaches, rethink their practices and beliefs (Adey & Hewitt, 2004). Beliefs of not only practicing teachers but knowing beliefs of prospective teachers are also essential because they play significant role in their learning (Uzuntiryaki & Boz, 2007) and in their pedagogical understanding. The required change does not take place because teachers do not practice the innovation (Cuban, 1988). Researchers have reported that personal epistemologies are linked to the types of classroom practices (Olafson & Shraw, 2010; Sinatra & Kardash, 2004; Tsai, 2002-2007).

Teacher education curricula for elementary teachers in Pakistan has been innovated to improve the potential skills as well as knowledge of the teachers for bringing change in the overall education sector and bring education system of Pakistan at par with the international standards. In the reformed curricula of teacher education for Associate Degree in Education (ADE) and four years bachelor degree developed in 2006 and revised in 2012 pupil centered approaches, reflective practices, pair work, group work, authentic assessment have been stressed upon in order to benefit from the universally accepted cherished tools like, critical thinking, hands on study and collaborative learning. The curriculum development is based on 5 Cs: Cooperative, Classroom based, Constructivist, Contextual and Creative classroom practices (Higher Education Commission, 2012).

Researchers have identified the influence of teachers' instructional beliefs on classroom practices related to teaching Mathematics (Vacc & Bright, 1999), science (Czerniak & Lumpe, 1996), history (Wilson & Wineburg, 1988), literacy (Fang, 1996) Math (Chrysostomou & Philippou, 2010) and Physics (Stathopoulou & Vosniadou, 2007). After deeper search in existing data bases, the researcher could not find work on

the general epistemological beliefs of teacher educators, especially, in the context of innovation in teacher education curriculum. Moreover, the researcher did not find empirical research on the relationship between epistemological beliefs and their relationship with teacher educators' instructional beliefs and classroom practices of teacher educators in the context of Pakistan. Furthermore, the epistemological beliefs, instructional beliefs and classroom practices of teacher educators have not been investigated in the context of reformed curricula for elementary teacher education in Pakistan.

1.1 STATEMENT OF THE PROBLEM

Researches have shown that for the successful implementation of educational innovations and implementation, the beliefs of teachers play a significant role. Elementary teacher education curriculum has been innovated in Pakistan. The epistemological beliefs and instructional practices of teacher educators have not been investigated whether they match the recommended practices for the innovated curriculum for the pre-service education of elementary teachers (Higher Education Commission, 2012). The current study investigated the general epistemological beliefs, instructional beliefs and relationship among epistemological beliefs, instructional beliefs and instructional practices of teacher educators in Khyber Pakhtunkhwa Pakistan.

1.2 OBJECTIVES OF THE STUDY

The objectives of this study were to:

1. Examine the epistemological beliefs of teacher educators in teacher education institutions

2. Find out the instructional beliefs of teacher educators in teacher education institutions
3. Find out the instructional practices of teacher educators in teacher education institutions
4. Measure the relationship between epistemological beliefs and instructional beliefs of teacher educators in teacher education institutions
5. Measure the relationship between epistemological beliefs and instructional practices of teacher educators in teacher education institutions
6. Measure the relationship between instructional beliefs and instructional practices of teacher educators in teacher education institutions
7. Find out the difference in the observed and self- reported instructional practices of teacher educators

1.3 RESEARCH QUESTIONS

Following were the research questions:

1. What type of epistemological beliefs do the teacher educators have?
2. What type of instructional beliefs do the teacher educators have?
3. What type of instructional practices do the teacher educators have?
4. Is there any difference in the observed and self-reported instructional practices of teacher educators?

1.4 HYPOTHESES

$H_0$1: There is no significant relationship between epistemological beliefs and instructional beliefs of teacher educators.

$H_0$2: There is no significant relationship between epistemological beliefs and instructional practices of teacher educators.

$H_0$3: There is no significant relationship between instructional beliefs and instructional practices of teacher educators.

$H_0$4 There is no significant relationship of epistemological and instructional beliefs with the instructional practices of teacher educators in teacher education institutions.

$H_0$5 There is no significant difference in the observed and self- reported instructional practices of teacher educators

1.5 SIGNIFICANCE OF THE STUDY

The study might be significant in the following ways:

1.5.1 Significance for Teacher Education

First, teacher education has been focused in Pakistan because all the national education policies, Educational Conference 1947, National Education Policy (NEP) 1970, NEP 1972-80, NEP, 2009 of Pakistan have recommended measures for the improvement of teacher education in Pakistan. National Educational Policy 2009 recommended (04) year degree program for prospective teachers. And this is a major reform, content, duration and practices wise, in the history of teacher education in Pakistan. However, an important link is missing that is the beliefs of teachers and classroom practices in the process of implementation of the innovated curriculum. Research has shown that teacher' beliefs play an important role in the implementation of any change in curricula, until and unless this gap is filled, curriculum innovation will not be effective (Adey & Hewitt, 2004; Spillane, Reiser, & Reimer, 2002; Handal & Herrington, 2003).

In Pakistan, teacher education curriculum is being implemented but has not been considered adequately in terms of beliefs and practices of teacher educators who are the real implementers and change agents.

1.5.2 Significance for Teacher Educators

The current study identified gaps between the beliefs and the recommended practices in classroom teaching. The identification of the beliefs might help in taking necessary measures for shaping the beliefs of teacher educators in consonance with the beliefs and recommended practices. The results will be shared with the teacher educators. Hence, they will come to know about their epistemological beliefs and twill help them in pondering over their beliefs.

Second, the research may find out the instructional beliefs of teachers. It may encourage teachers towards thinking on the importance of beliefs in teaching and learning process and the problems involved in the application of beliefs in classrooms. As constructivist approach is recommended in the existing ADE and B. Ed honor curricula and this approach is possible when teachers have constructivist beliefs. If teacher educators have proper beliefs about teaching and learning and present right sort of beliefs to the prospective teachers, these beliefs may trickle down to the whole system and real change in teaching and learning may occur.

1.5.3 Significance for Policy Makers

Third, the study may inform the policy makers and curriculum designers about the beliefs and practices of teacher educators and importance of beliefs in the implementation of curriculum innovation, and may ponder over the factors of teachers' beliefs and practices in the curriculum implementation in the real situation. So, the study would contribute to the theory of educational change.

Studies on Pakistani teacher educators' epistemic beliefs and their effects on teaching and learning are lacking in literature. The researcher did not find a single study on this important area in Pakistan while in other countries especially, in developed countries, a lot of work has been done. The study will add to the existing literature on teacher educators' beliefs towards teaching and learning in Pakistan.

1.6 DELIMITATIONS OF THE STUDY

Teacher education curriculum for elementary teachers has been implemented in all teacher education institutions of Pakistan. Due to time, geographical and financial constraints, collecting data from all the Teacher Training Institutes (TTIs) was not feasible. Therefore, the study was delimited to:

1. The IERs and RITEs in Khyber Pakhtunkhwa, Pakistan
2. Nine universities and 20 RITEs which have started B.Ed. honors/ADE programs.

1.7 POPULATION OF THE STUDY

The population of this study consisted of teacher educators from 09 universities and 20 Regional Institutes of Teacher Education (RITEs) in Khyber Pakhtukhwa. There were total 211 teacher educators at the time of the study.

1.8 SAMPLING

Stratified sampling technique was used for data collection. Total 158 teachers were sampled from both strata, teacher educators from RITEs and universities.

1.9 DATA COLLECTION TOOLS

Data were collected through Epistemological Beliefs Questionnaire of Shommer (1994), Instructional Beliefs Questionnaire (IBQ), Instructional Practices Questionnaire (IPQ) and Classroom Observation Scale. The latter two questionnaires and observation scales were developed after going through the relevant literature, discussion with the experts and pilot testing the questionnaires in the field.

1.10 OPERATIONAL DEFINITIONS OF TERMS

In this study the following terms/variables have been operationally defined:

1.10.1 Epistemological Beliefs

The current study looked at the epistemological beliefs from the point of view of Schommer theory (1990) that identified the following five dimensions about knowledge:

1. **Stability of knowledge**: Knowledge is considered as certain and unchanging rather than uncertain and unpredictable.
2. **Source of Knowledge**: Knowledge is handed down by teachers and other experts rather than constructed by independent reasoning.
3. **Structure of Knowledge**: This dimension of knowledge means that teacher educators view knowledge as simple and absolute rather than complex.
4. **Ability to learn**: The ability to learn is innate rather than acquired.
5. **Speed of learning**: Learning is immediate rather than a slow process of acquiring knowledge.

1.10.2 Teacher Education

In this study, teacher education is defined as the process, practices and curricula used for educating the prospective teachers.

1.10.3 Teacher Educators

Teacher educators mean the teachers of prospective teachers who teach to prospective teachers in universities and regional institutes of teacher education in Khyber Pakhtunkhwa, Pakistan.

1.10.4 Instructional Beliefs

Teacher educators' conceptions about teaching and learning.

1.10.5 Constructivist Beliefs

Constructivist beliefs mean the conceptions when teachers believe in the facilitation of learners for the construction of knowledge.

1.10.6 Traditional Beliefs

Traditional beliefs mean when teacher educators believe that teacher is the source of learning and knowledge.

1.10.7 Instructional Practices

Instructional practices mean the actual behavior of teacher educators in teacher education classrooms.

1.10.8 Traditional Instructional Practices

In traditional practices, teacher educator is the center of all activities in classrooms. He delivers lectures, gives notes; transmits knowledge; gives only known knowledge and does not encourage construction of knowledge from the practical experiences of learners.

1.10.9 Constructivist Instructional Practices

Constructivist instructional practices advocate reasoning, self-efforts, sharing and constructing knowledge. Teacher' educators work as facilitator.

1.10.10 Prospective Teachers

Students of teacher education in universities and regional institutes of teacher education

1.11 ASSUMPTION OF THE STUDY

Teacher educators from RITEs and universities were selected because they taught the same curricula to prospective teachers in Associate Degree of Education (ADE) in 04 semesters. The curriculum was developed by Higher Education Commission of Pakistan. Teachers from both the RITEs and universities got trained by the same organization and trainers. There is nothing which teacher educators from RITEs could not do as far as teaching was concerned. Thus, teachers from both RITEs and universities were considered for the study.

1.12 Conceptual Framework of the Study

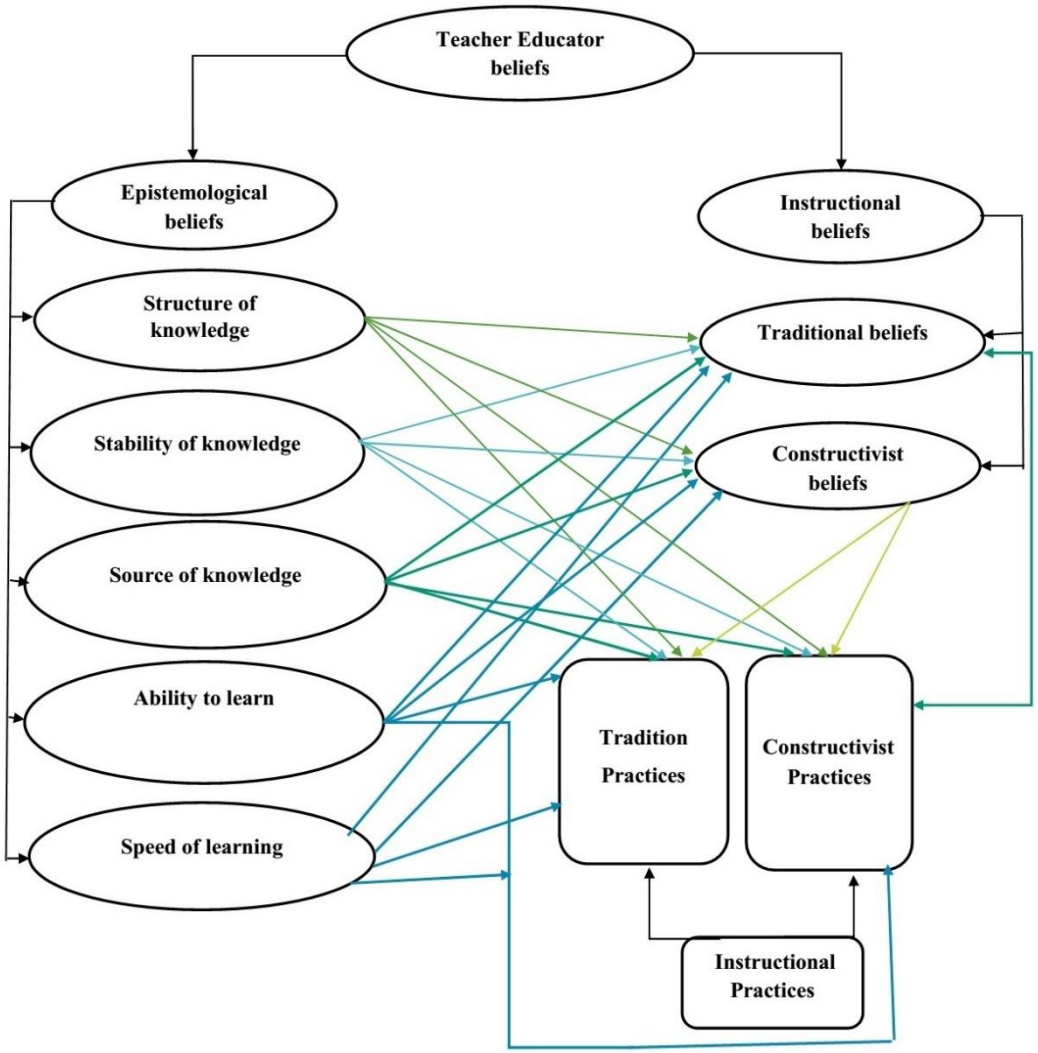

Figure 0-1 Graphical Representation of the Conceptual Framework of the Study

Figure 1.1 The graphical representation of this study.

The framework shows the five dimensions of epistemological model as conceived by Shommer (1994). The model has five dimensions: structure of knowledge, stability of knowledge, source of knowledge, ability to learn and speed of learning. Similarly, there are two dimensions of instructional beliefs: constructivist beliefs and traditional beliefs. Instructional practices have the same dimensions as that of instructional beliefs. The framework shows that the study investigated the

relationship of the epistemological and instructional beliefs with the instructional practices of teacher educators.

The theoretical background of the study stems from constructivism which deems knowledge as something constructed by the learners, not passed from a more learned to a naive person (Feucht & Bendixen, 2010). A constructivist epistemology considers how teachers view knowledge, how it is created and used. Shommer (1990) epistemological beliefs models was used for finding out the epistemological beliefs of teacher educators. In Shommer model the beliefs of the teacher educators in each dimension may be sophisticated or unsophisticated. Sophisticated beliefs views knowledge as complex, uncertain, time consuming and something which is acquired. The study investigated the instructional beliefs which are again divided into two categories: constructivist and traditional beliefs. Similarly, teacher educators' instructional practices are investigated from two perspectives: traditional and constructivist instructional practices. So, the overall, constructivist learning theory and Shommer (1990) model provided theoretical background of the study.

1.13 SUMMARY OF THE CHAPTER

This chapter provided introduction of the study, brief background to the research work, and problem statement. The chapter also presented objectives, hypotheses and research questions of the current study. Significance of the research has been given in detail. It also includes definitions of specific terms which have been used in specific meanings in the study. At the end, the chapter shows the conceptual framework of the study. The next chapter consists of the detailed context, teacher education in Pakistan, importance of beliefs, transmission and constructivist beliefs, description of constructivist and transmission type of classroom instructional practices.

Detail has also been given about different models of beliefs and the specific model of beliefs which have been used in this study.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter presents the status of teacher education, recent developments in teacher education in Pakistan, factors affecting teacher education and factors affecting implementation of curriculum reforms. It also discusses beliefs, different models of epistemological beliefs, instructional beliefs, instructional practices, relationship of beliefs and instructional practices, detailed discussion about the traditional and constructivist beliefs and instructional practices.

2.2 IMPORTANCE OF TEACHERS FOR QUALITY LEARNING

Educational system of any nation needs highly skilled teachers to advance the standards of education. Research shows that no educational system is more important than the quality of its teachers (Ministry of Education, 1959; Ministry of Education 1998-2010). The Report of the Commission on National Education in Pakistan (1959) has also explains that the teacher should be academically well trained in subjects he teaches and have had sound professional training to teach his subjects. It is commonly recognized that teachers are not only the most essential and fundamental components of an educational system, but they are also the most significant factors of change in any educational reforms.

UNICEF (2000) puts forth a model for quality education which encompasses five dimensions i.e. quality learners, quality learning environments, quality content, quality processes, and quality outcomes. Nothing in this model is possible without quality teachers. Darling-Hammond (2000) posits that teachers are the most important

elements who have direct effect on the learning of students and on the promotion of lifelong learning culture. Many studies show positive relationship between teachers' preparation and the quality of classroom performance. When teachers know more content knowledge, design various types of lessons and assessments, and consider students' perspectives, they will be more confident as professionals and their students will be more successful.

Quality education in teacher educational institutions is also vital for quality education in schools. Scannell (2002) reviews six effective teacher education programs in the United States, and finds the following effective characteristics: 1) a concept of good teaching is present in courses and field experiences; 2) theory is connected to the real practice; 3) lengthy field experiences are attached clearly with theory; 4) a clear accepted standard of practice is used to guide coursework and clinical experiences and to evaluate them; 5) schools and universities work together with shared beliefs; 6) there is detailed assessment which is closely linked with instruction; and 7) results of assessment are used to ensure that learners' learning is applied to real situations. These characteristics of successful teacher education programs could give quality teacher education programs to both developed and underdeveloped countries.

2.3 PROBLEMS OF TEACHER EDUCATION IN PAKISTAN

Research in Pakistani teacher education finds many areas for improvement. For instance, Dilshad (2010) investigates problems in teacher education from the perspective of students and finds that good quality of learners are available but the problem lies in the quality of content, learning environment in the institutions, process and results. He finds that the classrooms of teacher educational institutes are poorly equipped, course contents are lengthy, highly qualified teachers are not available and

English as a medium of instruction is an obstacle. The researcher suggests reconsideration of curricula, bringing up-to-date academic resources, use of constructivist approach and emphasis on faculty development for improving quality of teacher education. Mahmood (2014) collected data from 21 teacher education institutions to see if the teacher education institutions have the capacity to implement the reforms in Pakistan. He finds that majority of them are lacking the necessary human and physical resources for implementing reforms in education.

National education policy 2009 also points out causes of low quality in teacher education. The Education Policy 2009 notes that the poor quality of teacher in the system in large numbers is owed to the changes in governance, an outdated pre-service training structure and a less than adequate training regime (Government of Pakistan, 2009). The policy further emphasizes that for achieving quality in overall education, bringing quality in teacher education is essential.

There are many common problems that may be the causes of low quality of teacher education all over the world. Tom (1997) points out ten issues in any conventional teacher education program: i) vague goals, ii) disjointed courses where relevancy and coherency is missing iii) disorganization between courses from different faculties, iv) disharmony between university courses and school practices, v) low position of teacher educators even within a faculty of education, vi) lack of collaboration within the faculties of education, vii) vague career path of teachers and their role in practicum supervision, viii) involvement of many stakeholders , ix) lack of planning for change, and x) less reforms in teacher education. Hoban (2004) further adds gap of proper communication between universities and schools.

2.4 REFORMS IN TEACHER EDUCATION OF PAKISTAN

Keeping in view the needs of quality teacher education and numerous problems, reforms in teacher education is a continuous process in Pakistan. When Pakistan came into being in 1947, at that time 'Normal School' offered a (09) months teacher training course called Junior Vernacular (JV) and afterward Senior Vernacular (SV). Oriental Teaching Certificate (OTC) and Art Teaching Certificate (ATC) courses were also introduced with almost the same duration. The SV and JV were substituted with 48 week course of primary teaching certificate, secondary school and a course of Teaching Certificate (CT) with the same duration after Higher Secondary School. Many changes took place in organization, management and curricula for teacher education in late 60s and early 70s. The provincial Bureaus of Curriculum was established and the teacher training institutions offering PTC, CT and OT courses were upgraded to college of Elementary Teacher Education in Punjab and Regional Institutes for Teacher education (RITEs) in Khyber Pakhtunkhwa.

The management of teacher education institutions for primary and elementary teachers' education institutes was given to the Bureaus. The effective implementation of the Education Policy (1972-80) demanded a fundamental and continuing reconsideration of teacher education program at both pre-service and in-service. For this reason, the PTC and CT curricula were revised by the National Committee on Elementary Teacher Education Curriculum in (1974-75). In order to implement the new curricula effectively, teacher guides were developed in various school subjects and provided to all the educational institutions in the country during 1975. In the late 1990s, Diploma in Education was introduced to replace PTC and CT. It had two streams: one was three years program after matriculation and the second was one and half year program after higher secondary school certificate (Mahmood, 2014).

UNESCO (2006) also works on a project in Pakistan to develop standards for teacher education, accreditation and certification and makes a general structure for policy dialogue and professional development. The reports find that there is not any practical national framework and professional standards for teacher training. Resultantly, teacher education institutions develop their own teacher education programs. The report finds that there is lack of coherence and consistency in teacher programs all over the country. These findings demanded improvement in teacher education programs and proposed professional standards to assess the quality of teachers produced by these programs. These standards will work as framework for the production of innovative and relevant programs of pre-service teacher education. The programs will integrate liberal arts and science, subject matter, pedagogical studies and a series of supervised field experiences in schools. Teacher education has been given by the centralized departments in the provinces. They are not subject to any oversight or accreditation processes in Pakistan. There is lack of collaboration and communication due to policy making structure. Teacher education institutions have little linkages with the policy makers and schools.

2.5 EDUCATION POLICIES AND TEACHER EDUCATION

The first education conference which was held at Karachi from 27th November to 1st October, 1947 recommends properly trained and well paid teaching professionals (Ministry of the Interior & Education Division, 1947). National Education Policy of the Government of Pakistan, 1970 recommends the expansion of the normal teaching education program, condensed teaching training programs and this policy also recommends pedagogical subject at intermediate, degree level and technical institutions. Similarly, the education policy (1972-80) also recommends the study of education as a subject in secondary schools and general colleges because the need of

teachers in large number. Moreover, National education policy and implementation program 1979 also gives great importance to teacher, teacher is the pivot of the entire educational system. This policy stresses knowledge of the subject, techniques of teaching and commitment to the ideology of Pakistan. Consequently, all the teaching training institutions are upgraded.

The National Education policy (1998-10) pin points the absence of coherent policy framework for teacher education, theoretical courses, lack of professional training for teachers, less qualified teacher educators, lack of coherence between teacher education curriculum and schools' curriculum. Similarly, education sector reforms (2001-2005) also identifies teacher education as a matter of concern in Pakistan for the sake of bringing quality in education, and calls for radical changes in teacher education.

National Education Policy of 2009 recommends quality in teacher education in order to raise the whole education system. The policy suggests reforms in teacher education, pre-service training and standardization in professional qualification. The Policy gives the following two recommendations:

1. A Bachelor degree along with Bachelor in Education (B. Ed) shall be the minimum requirement for teaching at the elementary school level. A Masters level qualification for the secondary and higher secondary with a B.Ed., shall be the qualification by 2018. One year B.Ed., PTC and CT are phased out. The existing teachers have to improve their qualification.

2. Teacher training arrangements, accreditation and certification procedures shall be standardized and institutionalized.

2.6 STEPS TAKEN FOR THE IMPROVEMENT OF TEACHER EDUCATION

In 2006, the HEC prepared a standardized format of studies for a four-year Bachelor in Education Degree (B.Ed. Honors).This proposed structure is now being implemented in IERs at different universities all over the country. This program has 135 credit hours extending over 8 semesters.

A national task force analyzed the existing pre-service teacher training programs curricula, practicum, pedagogy and presented scheme of studies. In November 2008, the Ministry of Education (MoE) adopted and notified ten National Professional Standards for teachers in Pakistan. These standards defined competencies, skills and attributes that are thought as essential targets for beginning teachers, talented master teachers, teacher educators and other educational specialists. The standards may lead the development of pre- and in-service programs of teacher education. Moreover, the National Accreditation Council for Teacher Education (NACTE) has been established and it has developed policies, procedures and a system for accrediting teacher education programs and institutions that offer teacher education programs. NACTE has developed criteria to assess the quality of teacher education programs through a defined process of institutional self-study and third-party assessments by expert educators in the field (Higher Education Commission, 2012).

2.6.1 Teacher Education Standards

The government of Pakistan is committed to quality education and quality education requires an effective teacher education. Teacher education can become effective when there are professional standards and mechanism for the accreditation of teacher education institutions. Ministry of Education (MoE) with UNESCO and financial support of USAID has

developed standards for teacher education. These professional standards for teacher education have been officially accepted by provincial/ area representatives in National Steering Committee on 7th November, 2008.

The professional standards for teacher education in Pakistan are:

1. Subject matter knowledge
2. Human growth and development
3. Knowledge of Islamic ethical values / social skills
4. Instructional Planning and Strategies
5. Assessment
6. Learning environment
7. Effective communication and proficient use of information communication technology
8. Collaboration and partnership
9. Continuous professional development and code of conduct
10. Teaching of English as second language/ foreign language EFL/ESL

Each standard has 3 parts: knowledge and understanding, behavior, attitude and values, performances (skills) (Government of Pakistan, 2009). The current study meets the National Standards for Teacher Education because the study also focusses upon the beliefs, behaviors and attitude of teacher educators in teacher education.

A national task force was formed and after a lot of consideration, it submitted its detailed report and pin pointed spaces in teacher education and suggested measures for improvement. The report is given at appendix A.

2.7 CURRICULUM INNOVATION AND BELIEFS

Educational innovation requires teachers to change their behaviors and practices. Educational reforms are not successful when teachers learn the surface of practices. Changes will be effective when the deep rooted beliefs of teachers are challenged and changes are brought in their attitudes, beliefs and practices (Adey & Hewitt, 2004; Spillane, Reiser, & Reimer, 2002).

Handal and Herrington (2003) suggest the use of constructivist approaches and assessment of learning based on noticeable outcomes. In Mathematics, reforms can succeed when the beliefs of the teachers accept it; otherwise, teachers follow their agenda in classrooms. Thus, there will be wastage of resources and energy. Levitt (2002) contends that the envisioned reforms in science education will not succeed when reforms and teachers are not on one page. Each standard for teacher education in Pakistan has 03 subcategories: knowledge and understanding; behavior and attitude, and values and performances (skills) (Ministry of Education, Government of Pakistan, 2009).

There are many factors, like, physical facilities, quality of students and number of students which affect the classroom behavior of teachers. Similarly, teachers' beliefs about knowledge have been found as an important factor which influences the classroom practices of teachers and there are many intervening factors which do not allow the teachers to enact their beliefs in the classrooms.

2.8 DIFFERENT PERSPECTIVES ON BELIEFS

Beliefs are illusive to definite definitions. According to Pajares (1992) they are "messy constructs", and they have been given different names by different researchers. These include: "explicit propositions" (Nisbett & Ross, 1980), "conceptions" (Ekeblad

& Bond, 1994), “personal theories” (Borg, 1999), “judgements” (Yero, 2002) “pedagogical principles” (Breen, Hird, Milton, Oliver, & Thwaite, 2001), and “inclination of doing something” (Pintrich, 1990).

According to Pajares (1992) researchers have to clarify what they mean by beliefs before conducting research on the topic. Beliefs have different meanings in different fields, for instance, in theology belief is synonymous with the term “faith”. Within the field of educational psychology, beliefs share meanings with the “action,” “strategies,” “attitudes,” “beliefs and principles,” “constructs,” “dispositions,” “advocated theories,” “overt theories,” “opinions,” “principles of practice,” “personal constructs/theories/epistemologies,” “ideology,” “implied theories,” “internal mental processes,” “insights,” “personal knowledge,” “personal practical knowledge,” “personal theories,” “perspective,” “practical knowledge,” “practical principle,” “rules of practice,” “schemata,” “social strategies,” “teachers' conceptions,” “teachers' understanding,” and “values” (Clandinin & Connelly, 1987; Pajares, 1992).

Rokeach (1968) opines that beliefs are not simple propositions. They cannot be obtained from a believer's actions or expressions. He argues that direct expressions of beliefs are not necessarily valid, and beliefs need to be inferred from the mixture of belief statements, intentions of behaviors, as well as belief-connected behaviors. According to Pajares (1992) beliefs are inferred and a belief becomes more certain when it can be seen in action and words of a person. Sometimes, beliefs will not be recognized because a person will not be consciously aware of his/her beliefs (Buzeika, 1996). Kagan (1992) asserts that most of a teacher’s professional knowledge may be regarded as belief while knowledge is generally regarded as belief that has been affirmed as true on the basis of objective proof or consensus of opinion.

2.9 EPISTEMOLOGICAL BELIEFS

Epistemology is described as the theory of knowledge and knowing, and it is a sub-discipline of philosophy concerned with the limits and scope, as well as the sources and nature of human knowledge (Muis, Bendixen & Haerle, 2006). Educational psychologists have theorized epistemology to be "a person's implicit beliefs and assumptions regarding the nature, acquisition, structure, sources and justification of knowledge" (Hofer & Pintrich, 1997).

Epistemological beliefs about learning are defined as beliefs about the nature of knowledge and the nature of learning involving the limits of knowing, the certainty of knowing, and the criterion of knowing (Jehng, Johnson, & Anderson, 1993). Students' epistemological beliefs are defined as a system of professed assumptions, beliefs and implicit theories learners hold about the nature of knowledge and knowledge acquisition process (Kizilgunes, Tekkaya & Sungur, 2009). Some people have differentiated between epistemology and epistemic, for instance, Kitchener (2002) posits that epistemological beliefs (or personal epistemology) are conceived in terms of personal beliefs about knowledge. In contrast, epistemic beliefs should be conceived in terms of beliefs about knowledge.

Epistemological belief works can be categorized into three groups:

1. The first group includes Perry (1970); Belenky, Clinchy, Goldberger, and Tarule (1986); Magolda (1992) and so on.
2. The second group worked on how epistemological development effect thinking and reasoning processes, for instance, (King & Kitchener, 1994; Kitchener, Lynch, Fischer, & Wood 1993; Kitchener, King, Wood, & Davison, 1989).
3. The third approach says that epistemological ideas are a system of beliefs that is more or less independent rather than showing a coherent developmental

structure (Schommer, 1990, 1994b). These beliefs may affect comprehension, cognition for academic tasks concerned with classroom learning (Hoffer & Pintrich, 1997).

2.10 A BRIEF DESCRIPTION OF THE MAIN MODELS IN EB STUDIES

The research on epistemological beliefs is traced back to the works of Piaget (1971) and Perry (1970); the latter researched epistemological development of male students at Harvard University. He finds that the epistemological beliefs change in a systematic way from simple to complex in college years.

2.10.1 Perry's Developmental Model of Epistemological Beliefs

Perry (1970) uses a checklist and identifies nine positions of epistemological development that are consequently categorized into four major perspectives: dualism, multiplism, relativism and commitment within relativism.

a. Dualism: It is a dualistic, right and wrong concept of the world wherein an authority (teacher) is considered to know the truth and transfers it to the student/learner.

b. Multiplism: There is recognition of multiple views. The learner considers the opinions of others and they are valued.

c. Relativism: The learner turns into a maker of meanings. He considers knowledge as contingent, contextual and begins to feel the need of choosing and affirming one's commitment.

d. Commitment: the learners show consistency in responsibility, engagement and continuous observance of relativism. They have strong

commitment to career, relationship and personal identity (Brownlee, 2001).

Perry (1970) who conducted research in USA posits that students move from dualism into ‘commitment’ and then into ‘relativism stage. When students come to see that some beliefs and opinions are more valuable than others depending on the circumstances. He notices that students need to rely on their values and personal beliefs while making decisions (Hofer & Pintrich, 1997). It is important to note that there are obvious limitations to Perry's work. It fails to consider women's perspectives. It does not explore the beliefs of younger or older people; and it excludes the perspectives of less affluent backgrounds. The perceived limitations give rise to research and thus other models are developed.

2.10.2 Belenky Model of Epistemological Beliefs

The study of Belenky, Clinchy, Goldberger, and Tarule (1986) is based on the interviews of 135 women in the USA. Some of the women study in college and others do not go to college. They focus on the role of self-as-knower and on how a woman's self-concept is entwined with her way of knowing. Their theory is that women's epistemological views are closely related to their perceptions of self and how they are related to the world in general (Hofer & Pintrich, 2004). They use a phenomenological approach involving intensive interviews in order to avoid imposing preconceived hypotheses and find that the women's data do not fit into Perry's model (Duell & Schommer, 2001).

The scheme of Belenky, Clinchy, Goldberger, and Tarule (1986) in USA places the different ways of knowing by women into five epistemological categories:

a. Silence: It refers to some women feel that they do not have a voice and they cannot share their knowledge.

b. Received knowing means that knowledge is considered as something that needs to be taken in from outside authorities.

c. Procedural knowledge refers to both separated and connected ways of knowing.

d. Separate means knowing through the more traditional objective epistemological stance and

e. Connected meaning refers to knowledge gained through an in-depth understanding of the perspectives of others.

2.10.3 Baxter Magolda Reflection Model of Epistemological Beliefs

Perry (1970) has not taken into consideration context and multiple views and Belenky, Clinchy, Goldberger, Tarule, and JM (1986) include only women's perspective, Magolda (1992) comes with another model which aims to isolate the epistemological belief patterns of male and female respondents while keeping in mind the contextual nature of epistemology. Through her research, Magolda (2001) identifies an order of four levels of development which she refers to as "ways of knowing". The identified levels are:

1. Absolute: In the absolute stage, knowledge is seen to be certain.
2. Transitional: knowledge is not considered as something which is certain but still has not got independent meanings for an individual.
3. Independent: knowledge is relatively uncertain and each person has her/his own beliefs and truths.
4. Contextual: At the contextual knowing level, although still uncertain, knowledge is judged by the evidence that appears within a given context.

There are some other models on epistemological beliefs but they do not focus upon gender and context. They focus more on how pre-existing epistemological beliefs influence thinking and reasoning.

2.10.4 King and Kitchener Reflective Judgment Model of Epistemological Beliefs

King and Kitchener (1994) emphasize on exploring the cognitive process involved in solving ill-structured problems by respondents. They believe that epistemological beliefs are tied to the ability to understand and construct solutions for ill-structured problems. They develop the Reflective Judgment Model after conducting cross-sectional and longitudinal research with students from late adolescent stages into adulthood. This model consists of seven distinct stages of epistemological development and is further categorized into three distinct levels:

1. The Pre-reflective Stage: The pre-reflective stage is characterized by a belief that knowledge can be known with certainty.
2. The Quasi-reflective Stage: At the quasi-reflective stage, there is an understanding that knowledge can contain elements of uncertainty.
3. The Reflective Stage: In the reflective stage, there is increased understanding that knowledge claims cannot be made with certainty but it is possible to make decisions based on what seems to be the most plausible approach using the evidence at hand. The last stage is considered more mature as it enables an individual to solve different kinds of problems, especially, those which do not have obvious solutions. They suggest that at this stage individuals are beginning to think more about the criteria of knowing (King, Kitchener & Hofer, 2002).

2.10.5 Schommer Model of Epistemological Beliefs

The above mentioned models and their conclusions are not free from criticism. Researchers have shown that each model shows a specific view of epistemology. Each research has not been done in different contexts. Consequently, the instruments which are used for data collection may not be transferred into different cultures and population. Kuhn and Weinstock (2002) posit that the various stage models and conceptualization of personal epistemology demonstrate lack of consistency in terms of epistemological elements that characterize each stage of development. Duell and Schommer (2001) submit concerns that using a uni-dimensional approach is limited due to the fact that with this approach the beliefs are determined by researcher at each stage. Keeping in view the uni-dimensional view of epistemological development mean the epistemological development moves from lower levels of epistemological awareness to higher levels in relatively predictable stages. Therefore, a researcher holding this point of view may not pick anything that does not fit into these predetermined patterns. Hence, this uni-dimensional approach limits the research on epistemological beliefs. Schommer (1990) suggests that personal epistemologies may be a system of beliefs and consequently develops the first multi-dimensional theory. The multi-dimensional theory includes the possibility that each of the dimensions of epistemological beliefs may develop separately from the rest, especially, when an individual's beliefs are in a transitional phase. Her theory identifies the following five beliefs.

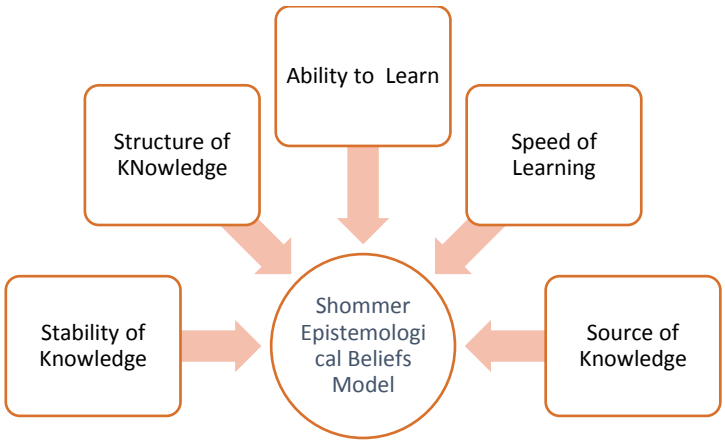

Figure 3.1: Shommer Epistemological Model

1. Stability of knowledge: Knowledge is more likely to be certain and unchanging rather than uncertain and unpredictable".
2. Source of Knowledge: Knowledge is handed down by teachers and other experts rather than constructed by independent reasoning".
3. Structure of Knowledge: This dimension of knowledge means knowledge as simple and absolute rather than complex.
4. Ability to learn: The ability to learn is innate rather than acquired.
5. Speed of learning: Learning is immediate rather than a slow process of acquiring knowledge (Shommer, 1990).

Each dimension can be conceived as a range with two extremities. For instance, ability to learn refers to ability being innate and fixed at one extreme, while at the other extreme ability is seen as changeable. Source of knowledge refers to knowledge being handed down by authority figures and experts at one end or knowledge being acquired through one's validation and reasoning at the other. Certainty knowledge refers to whether knowledge is certain, permanent and unchanged at one pole or tentative and ever-changing at the other.

Schommer (1990) develops a questionnaire consisting of 63 items to assess the beliefs of people. This has been used by researchers all over the world for finding epistemological beliefs of people. Like other models on the theme, Schommer model is not immune to criticism and challenges. For example, Hofer and Pintrich (1997) argue that the last two dimensions in the model, that is the speed of learning and the ability to learn, are problematic because they seem to make reference to beliefs and attitudes towards learning and not to individuals' personal epistemologies.

2.10.6 Kuhn Argumentative Reasoning Model of Epistemological Beliefs

This model is put forward by Kuhn (1991). Similar to the Reflective Judgment Model developed by King and Kitchener (1994), Kuhn's research focuses on solving of ill-structured problems and the research is carried out on a variety of people from teenagers to aged persons in USA. Kuhn and Weinstock (2002) propose four levels of epistemological development: realism, absolutism, multiplism, and evaluativism. They define these four levels in terms of how respondents approach assertions, reality, knowledge, and critical thinking.

At the realism level, assertions are believed to be copies of reality and knowledge comes from external sources. At the absolutist level, assertions are thought to be right or wrong and critical thinking helps to compare them to reality. At the ‘multiplism’ level, assertions become opinions; reality is not knowable and individuals create knowledge. At the ‘evaluativist’ level, assertions are judgments that can be compared. Reality is not directly knowable, knowledge is a human construction, and critical thinking is necessary in order to understand.

At first glance, Kuhn's theory coincides with the previously described uni-dimensional theories. What makes the model multi-dimensional is the fact that it includes five different judgment domains across which the epistemological beliefs

develop. The domains include personal taste, aesthetic judgment, value judgment, facts about the social world and facts about the physical world. Kuhn hypothesizes that people move from realism to evaluativist levels at different rates within the different domains (Kuhn, Black, Keselman, & Kaplan, 2000).

2.11 FORMATION OF BELIEFS

Everybody has beliefs and they develop through different sources. Generally, beliefs develop through a process of enculturation and social building. Beliefs can be formed by chance, deep experience, or a series of events (Pajares, 1992). Similarly, Richardson (1996) posits that teachers' beliefs come from three sources: personal experiences of the teacher in general and teaching in particular, teachers' experience as a student and teachers' knowledge of the school courses. Lortie (1975) observes that teachers acquire teaching skills through observation and it also helps them in making specific hypothesis. In support of this claim, Tsai (2007) posits that when teachers form their beliefs through experiences and observation; these may influence their classroom practices. Moreover, Fang (1996) says that factors in school, like, the administrative support, and attitude of colleagues, school atmosphere, students' abilities and background in addition to the rules and regulations have considerable effect on the belief system of teachers. Anderson (1984) views epistemological beliefs as product of both home and formal education. He says that children acquire experience and interpretation of it. The beliefs of children are influenced by parents. Parents' beliefs are affected by occupation and educational background and later on in schools teachers become source of change in beliefs.

2.12 BRINGING CHANGES IN BELIEFS

Teachers are required to think about students' epistemological perceptions regularly to nurture mature epistemological beliefs (Alvermann, & Gio, 2000). Deniz (2011) investigates two research questions: (1) how do prospective elementary teachers' epistemological beliefs in science change due to instruction specifically designed to improve their epistemological beliefs? And (2) what role does the conceptual ecology for epistemological beliefs play in the development of epistemological beliefs? A self- reported questionnaire is given at two different times to the teachers. Results show that there are changes in the epistemological beliefs of teachers. Teachers become more sophisticated in their beliefs with instructions. Teachers, with high thinking disposition, become more sophisticated in their beliefs. The study recommends that content related to epistemological beliefs may be added to the curriculum. Teachers may use enquiry approaches in teaching and learning which also develop sophisticated beliefs.

Epistemological beliefs may be changed when proper treatment is given, for instance, Cam and Geban (2011) use case-based learning instruction using small group discussion to find out effects on students' epistemological beliefs and attitudes toward chemistry in grade 11. They find significant difference in the score of controlled and experimental group on Schommer (1994) epistemological questionnaire.

Brownlee (2003) reports the findings of a one year long program for the epistemological development of primary school pre-service teachers in a large Australian university. He provides an in-depth analysis of two pre-service teachers' epistemological changes. The students are interviewed and are required to write journal daily. The epistemological beliefs of one pre-service teacher change from dualistic to relativist during the course of study but one of them remain more dualistic. There is a

positive relationship between the type of epistemological beliefs and teaching conception. Teacher who has dualistic point of view has transmission type beliefs about teaching. The teacher who has relativistic belief has constructivist approach towards teaching. Teachers have to play an important role in bringing paradigm shift from transmission to constructivist approach. To play such a role, many educators have to undergo change from transmission to constructivism.

There is also evidence that engaging in specific practices can change other teachers' beliefs that is particularly beliefs about inclusion, for instance, Swain, Nordness, and Leader-Janssen (2012) find that there is increase in pre-service teachers' beliefs about the inclusion of students with special needs after they complete an introductory special education class that included a 20-hour field component. The pre-service teachers observe and work with students. Similarly, Rushton, Lotter and Singer (2011) find that high school chemistry teachers are more likely to endorse inquiry views of science teaching after participating in professional development. The professional development includes a two-week summer institute and support throughout the academic year on beliefs about classroom management.

In contrast, Yilmaz and Cavas (2008) find that after participating in a teaching practicum, pre-service teachers become more controlling with respect to their beliefs about managing students and less controlling with respect to managing instruction. The study finds that age and education influence the development of epistemological beliefs. When human beings grow older, they become conscious that ability to learn can be improved and they come to know that knowledge is complex and it is constantly changing.

2.13 DEVELOPMENT OF SOPHISTICATED BELIEFS

Research conducted on the effect of beliefs shows that more advanced epistemological beliefs are connected with better learning (Bromme, Kienhues & Stahl, 2008). Moreover, sophisticated beliefs result in constructivist instructional practices (Windschitl, 2002). Tolhurst (2007) investigates the nature of epistemological beliefs of South Korean students about learning by using Johnson and Andersons (1993) model. He finds that there is relationship between students' beliefs and their academic achievement. The research suggests that for the development of sophisticated epistemological qualities, students need freedom and opportunities to be independent and responsible learners in their approaches to learning.

Walter (2009) studies the epistemological beliefs of 83 practicing teachers and 62 of these teachers study in a graduate program. Epistemological beliefs inventory (EBI) of Schraw, Bendixen and Dunkle (2002) and the four quadrant method of Schraw and Olafson (2008) is used for data collection. Differences in EBs are noticed to be based on education level, gender, and type of licensure. It is found that more educated educators hold advanced epistemological beliefs, small differences in the type of education can affect EBs. Women in the study endorse more in authority as a source of knowledge.

As research suggests that epistemological beliefs develop with education and time. Schommer (1994) finds that students in post-secondary education believe in the evolving nature of knowledge when they face opposing theories. When all the adults are not getting chance to get higher education, training in the nature of knowledge will better prepare them for practical life and day to day decisions.

2.14 GENDER DIFFERENCES IN BELIEFS

Kalsoom (2013) investigates relationship between English language teachers' beliefs and practices in Pakistan and the factors that hinder or promote implementation of beliefs about English grammar into teaching practices. She compares beliefs of secondary school English language teachers on the basis of demographic variables such as gender, qualification, locale, and experiences. She concludes that there is no significant differences in the beliefs of teachers on the basis of gender, locales, age, experience academic and professional qualification. Similarly, Chan (2004) administers (02) questionnaires to 385 pre-service teacher education students of the Certificate in Education (CE) program in Hong Kong. The researcher identifies four epistemological beliefs and two teaching/learning conception dimensions. The epistemological belief dimensions are labeled "innate / fixed ability," "learning effort / process," "authority/expert knowledge" and "certainty knowledge". The teaching / learning conceptions are labeled traditional and constructivist conceptions. The results reveal no significant statistical differences across age, gender and elective. Tanriverdi (2012) also finds no significant difference in the EB on the basis of gender but there is difference in EB on the basis of level.

Conley, Paul , Vekiri, and Harrison (2004) investigate the effects of gender and socio-economic status on the epistemological beliefs of students. They also find that there are no significant interactions between gender, ethnicity, socio-economic conditions, and achievement for any of the four beliefs measures.

2.15 VARIATION IN EB ON THE BASIS OF DISCIPLINE

Paulsen and Wells (1998) examine the differences in the epistemological beliefs of college students' across major fields of study in. Beliefs, in fixed ability, simple

knowledge, quick learning, and certain knowledge are assessed for 290 university students. They find that those students who majored in pure fields are less likely than those in applied fields to hold naive beliefs in simple knowledge, quick learning, and certain knowledge. However, students majoring in soft or pure fields are less likely than others to hold naive beliefs in certain knowledge. The results of this study suggest that students' beliefs about the nature of knowledge and learning are related to the disciplines.

Tanriverdi (2012) finds that students from ELT department tend not to believe that learning depends on innate ability compared to the students from science teaching and mathematics teaching departments. On the other hand, students from science teaching department tend that there is only one correct answer more than the students from primary school teaching, mathematics teaching, ELT and Pre-school teaching.

Cana and Arabacio (2009) investigate the beliefs of science, mathematics teacher candidates if the students EBS differ on the basis of gender and discipline and they also find the level of EBs. They use EBs scale developed by Schommer (1990) and find that the candidates believe 'there is one truth and learning depends on effort and ability'.

2.16 IMPACTS OF EPISTEMOLOGY ON LEARNERS

Epistemological beliefs affect approach towards learning. Learning beliefs form the degree of students' active involvement , perseverance in learning, and play an important role in reading comprehension, mathematical problem solving, formation of conceptual understanding and dealing complex questions or tasks (Schommer, 1994). Research shows that students' naïve beliefs stop forming critical aspects of learning,

whereas learners, who have sophisticated beliefs, are active, independent, persistent, flexible and open-minded.

These beliefs are of particular importance when one wants to get access into learners' academic achievement since beliefs widely affect students' approaches to learning, studying and problem-solving, as well as motivation and perseverance for information seeking (Tolhurst, 2007). Similarly, Schommer and Hutter (2002) find that beliefs in simple knowledge and certain knowledge can influence adults' willingness to think deeply and contemplatively about debatable and intricate issues in day-to-day life.

Similarly, Tolhurst (2007) theorizes that students' epistemological beliefs affect approaches to learning and learning outcomes. He conducts a study to investigate the likely influence of a new course on students' epistemological beliefs and the impact of these beliefs on their ultimate learning. The study finds significant negative correlations between the final grades in the course and some of the subscales on Schommer (1990) Epistemological Questionnaire. The findings indicate that students who believe in the quickness of learning or in the simplicity and certainty of knowledge achieve significantly lower final marks in the course. Contrary, students with more sophisticated epistemological beliefs achieve higher scores in the course.

Schommer (2009) tests the relations between ways of knowing and willingness to argue and finds that those who have sophisticated beliefs argue well. Belenky, Clinchy Goldberger and Tarule (1986) discover women's ways of knowing in USA. They divide women's ways of knowing into five categories. They are: silence, received knowledge, subjectivism, separate knowing and connected knowing. The first three are pre-procedural ways of knowing and the last two are procedural ways of knowing. Schommer (2009) finds the relations between the last two and willingness to argue. She finds that separate knowing has positive relation with willingness to argue.

Learners having sophisticated beliefs, usually have high academic achievements. Schommer, Duell, and Orpha (2005) investigate in USA the general epistemological beliefs and domain-specific mathematical problem solving beliefs of middle school students for finding their relationship with academic performance. Both general and domain specific epistemological beliefs predicate academic performance.

Beliefs are also related to mathematical problem solving. Schommer, Marlene, Duell, and Orpha (2013) collect data from over 700 college students through a domain general and a domain specific (mathematical problem-solving) beliefs questionnaire. Moreover, they complete two mathematical tasks; one that measure cognitive depth and the other problem solving. Students with high mathematical background demonstrate constancy between domain general and domain specific epistemological beliefs. On the other hand, students with less mathematical background are significantly different between the two levels of beliefs. The study finds indirect effects of general epistemological beliefs and direct effects of domain specific epistemological beliefs on mathematical performance. As a whole the research on epistemological beliefs suggests that personal epistemology influences learning.

Understanding the beliefs of teachers may be helpful in teaching and learning. Domain general beliefs have indirect effects, and it is in consonance with the theory that the effects of epistemological beliefs are subtle. Schommer-Aikins (2004) posits that an instructor will try to understand why students may resist explicit directions to take their time and to look for the mathematical structure of the problem while solving problem. The hurdles may be both domain general and domain specific epistemological beliefs. Therefore, instructors should consider assessing both domain general and domain specific epistemological beliefs. When students resist deep thinking, they do not search for understanding complexity and question the world around. Therefore, the

teachers should think about epistemological beliefs of the students. The teacher should express their beliefs explicitly.

Schommer (1999) examines the local newspaper, gender differences in conversation styles and abortion and finds that the adults believe in complex and tentative knowledge. The more the adults believe in complex and tentative knowledge, the more they appreciate multiple perspectives. Such people are ready to listen to others, modify their thinking and hold back final decision till they have full information.

2.17 TEACHERS' BELIEFS AND THEIR IMPORTANCE IN TEACHING

Luft and Roehrig (2007) investigates the beliefs of over 100 pre-service, induction and in-service science beginning secondary science teachers and experienced teachers' epistemologies by using semi structured interviews to explore the beliefs. They find that all teachers have personally constructed beliefs about teaching. It is important to understand the beliefs of teachers because beliefs show how teachers view knowledge and learning and they also suggest their classroom practices. Those teachers who want to develop programs of lasting impact for science teachers must understand the beliefs of teachers. When the teachers begin to understand the beliefs of teachers, they may be able to develop such programs for pre-service and professional development programs which can bring maximum development.

Teachers' beliefs have an indirect effect. These are usually thought as an implicit set of often unwillingly held conceptions about educational processes such as teaching, learning, curriculum, schooling and knowledge (Elen & Lowyck, 1999). Beliefs maybe derived from what people say, intend and do (Pajares, 1992) and they can tell us why teachers act in a certain way in classrooms. Teachers' educational beliefs

are considered as filter for teachers "instructional and curricular decisions and actions and therefore can either promote or hinder change" (Prawat, 1992). Research has been documenting the influence of teachers' beliefs on teachers' instructional practices for almost two decades (Fang, 1996). Beliefs may serve different functions or roles in relation to teachers' knowledge and actions (Fives & Buehl, 2012).

The effects of beliefs have been investigated in all content areas. Basturkmen (2012) Farrell and Bennis (2013), Kuzborska (2011) find that beliefs have a strong impact on classroom practices in English language teaching. Kagan (1992) notes that teachers hold unconscious assumptions about students, classrooms, and the academic material to be taught', they must be brought to the level of conscious awareness". Farrell (2008) posits that language teachers should express their beliefs to themselves and other teachers.

Many studies investigate the relationship between the type of approach to learning and classroom practices, most of such studies find positive correlation between the two. For instance, Song and Looi (2012) conducts case study of two teachers with different beliefs about student learning. They observe when they teach the same lesson plan on fractions and division. The teachers are thoroughly observed during their instruction. The researchers conclude that teachers with innovated beliefs apply inquiry based practices and they support inquiry based learning in students.

The beliefs of teachers play vital role in bringing change in schools and in the application of new instructional methods and techniques in classroom (Fluck & Dowden, 2010). Beliefs of not only practicing teachers but knowing beliefs of prospective teachers are also essential because they play an important role in their learning (Uzuntiryaki & Boz, 2007) and in their pedagogical understanding as well as their teaching methods and classroom practices (Bryan, 2003). Chan and Elliot (2004)

posit that teachers' beliefs affect conceptions of teaching and learning. Similarly, Guyton (2000) suggests if the beliefs of pre-service teachers are not developed in constructivist approaches, teachers face difficulty in the application of constructivist approaches.

Similarly, Moore (2008) uses a qualitative study design and investigates the relationship between primary teacher beliefs and practice in the primary classrooms of a small urban school in East Tennessee. She finds that beliefs do have a direct correlation to their practices, which is evident among the three teachers in the study. The beliefs of one teacher match with her practices (traditional beliefs and traditional practices) and the other teacher developmentally appropriate beliefs match her constructivist practices. The teacher whose beliefs fall in the middle demonstrates practices that are more constructivist than traditional.

Chew (2012) conducts an exploratory study on the beliefs and practices of teacher-child interactions of selected early childhood educators in Singapore. He investigates teachers' beliefs and practices in relation to classroom oral communication with children, especially, in the area of affective and instructional interactions. The study finds discrepancies between teachers' beliefs about oral interactions and instructional practices.

Kalsoom (2013) investigates relationship between English language teachers' beliefs and practices and the factors that obstruct or encourage implementation of beliefs about English grammar into teaching practices. She finds that most of the teachers' claim that they believe in communicative approach and teach grammar implicitly but the actual practice reveals that grammar is being taught explicitly.

Chan (2011) examines epistemological beliefs, conceptions of learning, and learning strategies. Questionnaires were administered to 231 teacher education students

of a university in Hong Kong. He suggests the important role of epistemological beliefs in learning because they have relation with teaching and learning.

Chan (2004) looks into epistemological beliefs and teaching learning conceptions of pre-service teacher education students. The researcher targets four epistemological beliefs: "innate/fixed ability, learning effort/process, authority/expert knowledge and certainty knowledge, and two teaching/learning conceptions: "Traditional and constructivist conceptions". Analysis reflects significant relations between epistemological beliefs and conceptions about teaching and learning

Similarly, Chai (2010) after conducting a qualitative study on seven teachers in Hong Kong posits that all seven teachers express more or less relativistic epistemic beliefs but their pedagogical beliefs are more knowledge transmission type. The association between epistemic beliefs and instructional beliefs seem to be intervened by teachers' awareness of students' readiness and their priorities in the school, i.e., tests and examination. Teachers need more conducive environment created by school leaders and policy maker for applying relativistic beliefs in classroom.

2.18 SIGNIFICANCE OF EB IN TEACHER EDUCATION

Teacher educators and researchers also suggest that teachers' beliefs are important for teacher preparation and in-service learning and they need to be considered (Tatto & Coupland, 2003). Research shows that epistemological beliefs foretell teachers' instructional beliefs (Olafson & Shraw, 2010). Studies largely establish that advanced epistemological beliefs are linked to students' engagement in learning and they are related to a number of learning outcomes (Schraw & Sinatra, 2004). Heather, Green and Hood (2013) investigate the importance of EB in the field of Psychology and finds that EB have advantages for teaching and learning. All the teachers of psychology

should acquire knowledge about educational significance of EBs. They say that when teachers teach implicit knowledge about EBs, it may benefit students. They find that strategies, like, encouraging students to structure knowledge themselves, reviewing historical development of an area, constructivist approaches and feedback to students that stress upon core understanding. Teachers also need to address students' epistemological perceptions regularly to nurture mature epistemological beliefs (Qian & Alvermann, 2000). Knowing pre-service teachers' beliefs about knowledge, teaching, and learning is essential because these beliefs play a significant role in their own learning (Uzuntiryaki & Boz, 2007) and in their instructional methodologies (Bryan, 2003).

Some researchers suggest that there is a connection between teachers' EBs and their instructional practices (Brickhouse, 1989; Carr, Barker, Bell, Biddulph,, Sinatra & Kardash, 2004; Tsai, 2007). They find that teachers with sophisticated beliefs tend to choose more inquiry based and constructivist approaches in teaching. Teachers holding more sophisticated EBs are more likely to choose inquiry-oriented and constructivist teaching practices than their colleagues with less sophisticated EBs. All evidences show that there is significant correlation between epistemological beliefs and instructional practices (Epler, 2011).

Tanriverdi (2012) studies the relationship of epistemological beliefs and instructional approaches. Personal epistemological beliefs can pin point which pedagogical approach may be used in classrooms. He collects data from 630 pre-service teachers on EBQ and revised version of Biggs' Two Factor Learning Approaches Scale (RSPQ-2F). He finds that those students who believe that learning depends on '*innate ability'* were surface motivated and does not use deep approach towards study. On the other hand, those students who believe on 'effort' are deep motivated. They opt for

deep study approach. Turkish education students believe that learning depends upon effort. Therefore, deep approach was slightly higher than surface approach. His study proposes that for improving the science teachers, the epistemological beliefs of these teachers must be developed and shaped.

2.19 IMPACT OF EB ON TEACHING AND STUDENTS' LEARNING

Research into epistemological belief has made progress in the area of pre-service teacher education. According to Chan (2008) there exists clear relation between pre-service teachers' epistemological beliefs and their conceptions regarding effective teaching and learning. It is claimed that pre-service teachers' personal epistemologies are influenced by what they notice while observing exemplary teaching practices (Yadav & Koehler, 2007) and that these observations influence their teaching goals (Kang, 2008). A study involving pre-service 228 fourth year pre-service teachers carried out by Chai, Teo, and Lee (2009) who use a mixed method research approach to investigate conceptions of teaching and personal epistemologies. Their surveys measure pre-service teachers' personal epistemologies using the epistemological beliefs questionnaire developed by Schommer (1990) and a conception of teaching (COTI) scale to measure beliefs about teaching approaches. Both qualitative and quantitative data find that a large number of pre-service teachers believe that knowledge is constructed by the individuals and the personal epistemologies are positively related with the constructivist approaches. Similarly, research into personal epistemologies carried out with early years' teachers by Brownlee (2001) finds that teachers with evaluativist personal epistemologies prefer child-centered and constructivist

approaches to teaching. Child care teachers with more simple personal epistemologies prefer such teaching methods which are more teachers centered.

Teachers who have more sophisticated beliefs have less teacher centered classes (Tsai & Liang, 2009; Brownlee, 2001; Sing & Khine, 2008). Schraw and Sinatra (2004) note that teachers with sophisticated beliefs use different teaching strategies and they engage more their students in learning. Moreover, teachers with sophisticated beliefs try to find out the misconception of students and work on conceptual learning of students.

Windschitl (2002) posits that teachers with developed epistemologies acquire strong acts of constructivism in their students which enable the students to develop meanings. Such teachers give real life examples and relate classroom to real life situations. Students are always engaged in higher order thinking. They do not focus on reproduction of what they learnt. In contrast, when teachers have less developed epistemologies, they create surface practices in the classroom. Windchitl (2002) accepts that teachers try their level best to use constructivist approaches according to the level of the sophistication of their beliefs.

Many studies show that teachers' beliefs have become a topic of great interest for the researchers because educationists think that teachers have to go beyond the classroom practices to their beliefs (Pajares, 1992; Fang, 1996; Calderhead, 1996). The popularity of belief studies is based on the understanding that teaching needs to go beyond teachers' behavioral patterns and look at what is in teachers' minds. Researchers show many reasons for investigating epistemological beliefs, for instance, Pajares (1992) finds that beliefs are the best foretellers of individual behavior; and teachers' beliefs influence teachers' perceptions and judgment, which, in turn, affect classroom performance. Alexander and Dochy (1995) give four influences of beliefs; beliefs shape

individuals' thoughts and actions, form their holistic perception of the world and guide their reactions to uncertainty and ambiguity. Teachers' beliefs create their understanding of learning environments and responses to teaching materials and also their approaches to teaching. However, conducting study on the topic is fraught with difficulties and the first difficulty is the definition of beliefs and varieties of conceptions about beliefs.

Richards and Lockhart (1994) explain that teachers' actions are reflections of what they know and believe. Teachers thinking and knowledge provides a frame which guide the teachers' actions in the class. Ajzen (1991) recommends that there are a number of elements between beliefs and practices, which cause beliefs and practices to mismatch. There is an interactive relationship between beliefs and practices. Experience and reflection on action affect and can change beliefs (Richardson, 2003). Pajares (1992) adds that behaviors formulate to fit in particular circumstances, though initially different from beliefs, may result in belief changes or reshaping. In addition, sometimes people are not aware of their beliefs and thus cannot explicitly explain them. Researchers need to infer their `tacit knowledge' from their actual behaviors (Argyris & Schön, 1974). There is a risk of misconception, as similar practices may come from different beliefs. In addition, some beliefs or theories are not observable in practice as individuals' behaviors do not completely show everything they know. Teachers' belief systems, according to Richards (1998) are related to the goals, values, and beliefs of teachers, content and instructional processes.

2.20 LINK BETWEEN TEACHERS' BELIEFS AND INSTRUCTIONAL PRACTICES

Although literature in the previous section shows clear links between beliefs and practices but there are other studies which show no such links. For instance, in a study with 1,340 elementary school teachers, Liu (2011) finds that the majority of the teachers do not enact their beliefs in classrooms.

Jorgensen, Grootenboer, Niesche, and Lerman (2010) look into 25 teachers' beliefs about various pedagogical practices through the use of a survey and analyze videotaped recordings of their practices. The teachers claim the importance of inclusiveness/importance of culture, group work, connectedness of ideas, and multiple pathways. But when the researchers observe them through video recording, they find inconsistency between the beliefs and actual practices. Similarly, Lim and Chai (2008) find when they plan and implement computer-mediated lessons in mathematics, science, and English, five of the six teachers express a constructivist orientation to teaching but observed lessons are predominately traditional. Such studies are used as evidence that beliefs and practices may not be related. Similarly, Khader (2012) finds variation in the stated beliefs and practices which are caused by lack of essential conditions in the context like overcrowded classroom, busy schedule and other assignments Similarly, Chew (2012) findings indicate that most teachers have similar expressed beliefs, however, their practices differ.

Chan, and Elliott (2004) investigate four epistemological beliefs and two teaching and learning conception of Hong Kong teacher education students. The epistemological beliefs are "innate/fixed ability, authority/expert knowledge and certainty knowledge with traditional conception and learning effort/process with

constructivist conception". They find all teaching and learning strategies are beliefs driven. They suggest further investigation on the relationship in different cultures.

Researchers find that not only beliefs influence action but it is also the other way round, it means that practices also effect beliefs (Basturkmen, 2012; Mansour, 2009; Richardson, 1996) assert that the strength of relationship may be different across individuals and contexts as well as the type of beliefs and practices being assessed. Similarly, longitudinal studies of pre-service and practicing teachers' beliefs and practices provide evidence of the reciprocal and dialectical relations between beliefs and practices (Mouza, 2009).

Kang (2008) studies pre-service secondary science teachers enact their personal epistemologies and science teaching goals into specific actions during a science methods course. The course consists of a six-hour a week field experience in which the pre-service teachers observe and taught science lessons. Total 48% of the 23 pre-service teachers in the sample maintain their initial personal epistemologies and science teaching goals and practice these beliefs in their teaching, 30% of participants engage in practices that are different from their initial beliefs. Particularly, five pre-service teachers practice more sophisticated practices than their beliefs may suggest. When these teachers are successful in their efforts, they see a change in their epistemology and teaching goals.

Potari and Georgiadou-Kabouridis (2009) also observe a change, in a case study of elementary teacher, the initial beliefs of pre-service teacher after teaching experiences. The change in her beliefs causes changes in her teaching approaches.

Fives and Buehl (2012) suggest that researcher should not only seek relationship between practices and beliefs or the other way round but they may also look into other aspects, like, the variation in the relationship between beliefs and practices as well as

the outcomes of alignment between beliefs and practices and misalignment. They conclude from their review that the development of the teacher is one factor that contributes to the alignment of beliefs and with the classroom practices.

It is not necessary that beliefs must be permanent; there is a transitional stage as well. It is not necessary that teachers will have either traditional or sophisticated beliefs but they may be in transition as well. For example, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) look into the beliefs and technology integration practices of 12 K-12 teachers recognized for their award-winning technology practices. Out of 12 teachers, 11 teachers practice according to their stated beliefs but the beliefs and practices of one teacher are not aligned. However, they notice evidences which show that the teacher is in transition. She is going to use more students' oriented teaching.

Experience of the teacher is also related to the consistency of beliefs and practices. As Basturkmen (2012) find that the relationship of beliefs and practices is more consistent for experienced teachers as compared to less experienced teachers. The lack of relationship between teachers' beliefs and practices may be linked to changes in teachers' beliefs that are not yet shown in their practices or the other way round. Farell and Ives (2015) investigate the relationship between one ESL teacher's beliefs and practices connected to L2 reading. The findings indicate that the teachers' beliefs provided a strong basis for their classroom actions. Language teachers need to reflect on beliefs and classroom practices because they are inter-reliant and both shape each other, and are shaped by each other (Li & Walsh, 2011).

2.21 CONSEQUENCES OF CONGRUENCE/INCONGRUENCE OF BELIEFS

Bryan (2012) posits that the implementation of reforms in curriculum is conceded when teachers' beliefs do not have harmony with the philosophy of the reforms.

Researchers study teachers' beliefs in order to mold them according to the best teaching practices in vogue. The value of studying beliefs lies in the foretelling of the type of practices. When teachers are asked to implement such practices which are against their beliefs, it may go against the teacher satisfaction and well-being (De Jong, 2008; Potari & Georgiadou-Kabouridis, 2009). When teachers find that they have to implement a curriculum which is against their beliefs, they do not implement the changes as desired or they leave the profession. For instance, Greene, Caskey, Musser, Samek, Casbon, and Olson (2008) study the effects of accountability policies in 'No Child Left Behind' on teachers' practices observe that sense of belonging to the students is negatively affected by the accountability factors. Many good teachers leave the profession.

Hashweh (2003) identifies a set of conditions for teachers in order to carry out innovations or reforms that require them to re-examine their traditional beliefs and practices. They should have self-motivation for professional development; they must look at the gap between their goals, beliefs and practices and must know their implicit knowledge, beliefs, practices and the limitations of their current knowledge. The researcher further elaborates that if these conditions are not met, teachers may continue with the conflicts or they might change the new ideas in such a way which can preserve their prior beliefs.

Teachers may likely adopt new classroom practices when they meet the epistemological beliefs of the teachers (Yocam, 1996). Beliefs form a filter which explains professional development and teacher reforms. These beliefs promote, change or stop it (Prawat, 1992). When the reform or change does not meet the belief system, there is resistance. When the changes are compatible with the belief system, there is great likelihood of adopting the changes (Burkhardt, Fraser & Ridgeway, 1990).

According to Nespor (1987), change is not possible without first quitting current beliefs and replacing traditional beliefs with the intended ones. It cannot take place soon. Studies in personal epistemological beliefs pin point that these beliefs put great, subtle and unconscious influence on teaching, learning and their outcomes (Pajares, 1992; Fang, 1996; Gess- Newsome, Southernland, Johnston, & Woodbury, 2003). Thus, as Breen, Hird, Milton, Oliver, and Thwaite (2001) put forth each innovation in classroom practice from the acceptance of a new technique or textbook to the implementation of a new curriculum has to be housed within the teacher's own belief system.

Tillema (1994) posits that beliefs work as filters; accept some innovations and reject others. The filtering effect of beliefs has also been stressed by Pennington (1996) who claims that teachers' existing beliefs function as filter, hinders or modifies new information coming in. Similarly, Handal and Herrington (2003) suggest about the use of constructivist approaches and assessment of learning based on demonstrable outcomes in Mathematics that the reforms can succeed when the beliefs of the teachers accept it, otherwise, teachers will follow their agenda in classrooms. Thus, there may be wastage of resources and energy. Moreover, Levitt (2002) contends that the intended reform in science education will not succeed when reforms and teachers do not move along.

2.22 STEPS FOR SUCCESSFUL IMPLEMENTATION OF CHANGE

Teachers may acquire the skills which can enable them to implement the change when the change is a bit against their beliefs. Moreover, teachers need to examine the innovation and they need to be monitored and supported in such a way that can increase their personal practical understanding and knowledge of innovation. If teachers are not equipped with necessary understanding, they may turn back to their previous practices and the intended change may not be realized. Further, teachers who are very much enthusiastic about the change will be without sufficient retraining, even teachers initially enthusiastic about an innovation may be bothered by the problems in innovation and at last can turn against it (Carless, 1999).

Harris (2003) suggests that if teachers are interested to learn new things, they have to internalize new knowledge and think over what they learn. Changes in classrooms need more than the acquisition of new knowledge. It needs change in beliefs, attitudes, and personal theories of learning. Teacher may reflect on their practices and practices of others.

Teachers face different hindrances while trying to enact educational innovations. Shamim (1996) claims that many teacher education programs do not consider the dynamics of change and expected challenges in the implementation. Thus, they are unable to face the challenges, consequently, change is not implemented as planned. She says that teacher trainers should discuss with teachers the barriers involved in the implementation of the innovations. Thus, teachers will be able to develop strategies to deal with the problem in the implementation of the innovation.

Teachers' beliefs play an important role in teachers' acceptance or otherwise of innovations in education. In some cases, teachers may not be aware of their beliefs, they

need to be aware of their current beliefs and the beliefs which are required for the new changes. Baugh (1996) suggests that all teachers work according to their beliefs of good classroom practices but most of the teachers never think consciously over their beliefs. Thus, an important part of the in-service training should be to make the teachers think over their beliefs. They should be trained to review their existing beliefs according to the demands of innovations.

Shamim (1996) opines that teachers, parents, students and communities have to change their behavior for implementing innovation. Change becomes easy when it is connected with the culture of the community. When an innovation is not according to the norms and thinking patterns, necessary changes must be made in the innovation so that it becomes suitable for the culture.

Similarly, Holliday (2001) calls for innovations "to be sensitive to the cultural expectations of the recipients of the innovation, whether they are students or teachers encountering new teaching methodologies, or stakeholders in curriculum projects". Besides, in addition to the socio and cultural factors, there are many other elements which can affect the implementation of change, for instance, examination system and resources.

Jehng, Johnson and Anderson (1993) find that when science teachers attend a teacher training program in Egypt, they are unable to enact it in classroom because there are certain issues, like, large classroom size, lack of resources, students' resistance and resistance from the school. There are also other factors which are involved in the implementation of the changes like, expectations and value given to education in the system at large.

2.23 FACTORS AFFECTING THE ENACTMENT OF BELIEFS IN CLASSROOMS

Hallett (2010) investigates the epistemological beliefs and practices of teacher educators involved in teacher education at post graduate level in UK. In UK standards are introduced in teacher education and educators are asked to confirm their beliefs to the suggested approaches. Majority of the teachers feel pressure to teach according to certain standards. Post graduate teachers confide that when they try to bring harmony in their beliefs and practices, they cannot address the real world issues.

Cain (2012) investigates the relationship of beliefs and practices of 3 primary teacher trainees in Trinidad and Tobago. He finds that the trainees have their beliefs about teaching and learning. Their beliefs are influenced by their experiences in schools, home and as primary school teachers, childhood experiences, knowledge, commitment and determination 'to make a difference'. He suggests that trainees should be given chance to interrogate their beliefs.

Similarly, Lotter, William, and Jose (2006) investigate through case study and detailed interviews the application of inquiry based teaching in classroom after a yearlong training in inquiry based teaching. They suggest that teachers should not be only given knowledge of new methods but the teachers' core conceptions of teaching science, their students, effective teaching practices, and the purpose of education should also be assessed and considered, otherwise, professional development will be less effective.

Chew (2012) investigates the beliefs and practices of teacher-child interactions of early childhood educators in Singapore. They find that teachers' level and types of general education, prior early childhood school experiences and personal attributes have vital effect on their verbal behavior. Classroom physical and material environment

and the opportunities given to teachers to change adjust their lessons and thus enhance teacher-child talk.

There are different beliefs and teachers' practices may be affected by all these beliefs (Woolfolk-Hoy, Davis & Pape, 2006). Teachers' own beliefs may facilitate the classroom practices or discourage. Teachers' capability is another factor which can work both ways- facilitate or hamper the classroom practices (Tang, Lee, & Chun, 2012). Similarly, teachers' sense of responsibility for students learning is another such belief which may facilitate classroom practices (Roehrig, Turner, Grove, Schneider & Liu, 2009). When teachers believe in students' capabilities, as well as their own, such beliefs may supersede other less adaptive beliefs. For instance, Hertzog (2011) finds that even though a teacher may not hold much good view about students' home languages and cultures, if she believes strongly in her students' capability to learn and treat students with respect and use many effective practices for language learning. Then he/she can be successful in the implementation.

2.23.1 Organizational Factor

Situational and personal factors, like, college colleagues, fellow trainees, supervisors, cooperating teachers and pupils influence the trainee's ability to implement changes (Cain, 2012). Khader (2012) also examines the relationship of beliefs and practices through a qualitative study approach. First of all, he finds the beliefs of teachers about the teaching of social studies and then finds the classroom practices from the perspectives of students. The study finds discrepancy in beliefs and practices. The possible causes of this disharmony are overcrowded classrooms, busy schedule and other assignments of teachers. The study recommends training courses on how to enact beliefs into practices. Lucy (2012) posits classroom physical and material environment and the opportunities given to teachers to modify and adapt their teaching methods.

Kalsoom (2013) investigates the relationship between English Language teachers' beliefs and practices and the factors that obstruct or encourage implementation of beliefs about English grammar into teaching practices. Teacher pedagogical belief system is not easy to understand rather they have a complex set of beliefs. Talking about beliefs in the context of grammar teaching, it depends on teachers' teaching abilities. She finds "Teachers' theoretical beliefs have positive impact on their instructional beliefs and practices". She also posits that contextual factors, like, resources, material and incompetent learners are factors which hinder the enactment of teachers' beliefs in classrooms. According to Maiklad (2001) who investigates the relationship of beliefs and their enactment in Thailand posits that teachers are restricted from the implementation of change by external factors, like, administration, lack of resources, overloaded contents to teach, students' and teachers' conditions, societal expectations, exam-based assessment and the un-official place of English in Thailand.

Chai (2010) after conducting a qualitative study on seven teachers in Hong Kong posits that all seven teachers express more or less relativistic epistemic beliefs but their pedagogical beliefs are more knowledge transmission type. The relationship between epistemic beliefs and pedagogical beliefs seems to be mediated by teachers' awareness of students' readiness and what they allege as their priorities in the school, for instance, tests and examination. Teachers need more conducive environment created by school leaders and policy makers for applying relativistic beliefs in classroom.

Different schools offer different contents which may also become a hindrance in the implementation of beliefs. Moreover, the school context, administration, parental support and resources are other important factors that contribute into the

implementation of beliefs. But the most important thing is how the teachers perceive the challenges (Rentzou & Sakellariou, 2011; Southerland, Gallard & Callihan, 2011).

2.23.2 Classroom-level factors

Students' ability (Savasci & Berlin, 2012), student attitudes (Sutherland, Lewis, Stichter & Morgan, 2008), classroom management (Phipps & Borg, 2009; Teague, Anfara, Wilson, Gaines & Beavers, 2012) and class size (Dooley & Assaf, 2009) are the present challenges to both practicing and pre-service teachers in enacting their beliefs. Students' attitudes and priorities for instruction as well as students' overall stances and behaviors also influence the practices teachers' implement (Bullock, 2010; Southerland, Gallard & Callihan, 2011).

Students can become a big hurdle in the implementation of beliefs or suggested ways of teaching. For instance, in studies of constructivist beliefs, teachers report that they face difficulty in the implementation in inquiry learning due to students' reluctance to engage in higher level thinking (Kang, 2008). Savasci and Berlin (2012) finds that students prefer worksheets to inquiry-based instruction in order to avoid deep thinking. Similarly, in another study (Savasci & Berlin, 2012) constructivist-oriented secondary teachers are reluctant to implement group work because of students' misbehavior. Large class sizes have also been noted to limit the implementation of practices that teachers consider as effective (Uzuntiryaki, Boz, Kirbulut & Bektas, 2010).

For pre-service teachers, working in another teacher's classroom or under the supervision of a cooperating or mentor teacher may present additional challenges for acting on their beliefs about teaching. For instance, Kang (2008) finds that pre-service science teachers are reluctant or unable to enact certain instructional practices because they are teaching in someone else's classroom, the students are not their own, and they do not have relationships with the students. Similarly, in a study Ogan -Bekiroglu and

Akkoc (2009) find the pre-service teachers in their study are unable to implement constructivist teaching strategies because their mentors expect them to use activities such as multiple choice questions and to cover multiple topics in one lesson. Such studies highlight how pre-service teachers may not be fully supported in enacting their beliefs during their field experiences.

2.23.3 Societal Factors

Rehmani (2006) investigates the perceptions of teachers' about teaching and learning and finds that teachers' conceptions develop in a sociocultural environment. Factors such as schooling experiences of teachers, how teachers are taught in school, pre or in-service teacher education programs, and the cultures of the schools affect the implementation of beliefs in schools. Second, the attitude of teachers towards their profession, lack of training opportunities, shallow understanding of education and classroom management issues also intervene in the implementation of beliefs in the field. Above all, knowledge is also a factor for enactment of beliefs in real situation.

Some researchers find that teacher cannot implement their beliefs because they lack necessary knowledge which is required for the successful implementation (Bray, 2011; Kang, 2008; Rushton, Lotter & Singer, 2011). Ogan-Bekiroglu and Akkoc (2009) also find the pre-service teacher hold constructivist beliefs about physics instruction; the lack of the science content knowledge as well as the knowledge and skills for implementing constructivist practices obstructs the extent to which their beliefs are observed in practice. National, states, and district-level factors, education policies and curricular standards, in the United States and abroad, may present challenges to teachers, in enacting practices incongruent with their beliefs. However, the influence of these external factors depend on the type of policy, the teachers' role in the political context, and teachers' individual perceptions. Language instruction is one area in which

policy may affect teachers' beliefs and practices (Cincotta-Segi, 2011; DeJong, 2008; Tan, 2011; Valdiviezo, 2009).

In the United States, DeJong (2008) studies the influence of an English-only law passed in Massachusetts in 2002, on bilingual and structured English immersion (SEI) elementary teachers' beliefs and practices. Many teachers experience extreme emotional conflict when they are forced to teach children in ways that are not culturally responsive and thus do not align with their beliefs. A similar law is passed in the Lao People's Democratic Republic (LPDR) which declares Lao the official language of that country. Cincotta-Segi (2011) studies how one teacher in a remote village matches his own beliefs to instruct students in their home language of Kmhmu against the constraints impose on his beliefs and teaching by this policy. The teacher uses his mother tongue for creativity and supporting learning in L2.

Curriculum standards create pressure for content coverage for administrators, practicing teachers, and pre-service teachers in field-based experiences (Dooley & Assaf, 2009; Greene, Musser, Casbon, Caskey, Smaek, & Olson, 2008), and much like national policy, play out differently in various contexts. In Greece, Potari and Georgiadou-Kabouridis (2009) also find that curriculum is a restraint on the beliefs of teacher. In the United States, the No Child Left Behind (NCLB) law has had a notable effect on teachers and students due to its emphasis on student achievement in mathematics and reading (Dooley & Assaf, 2009). For instance, Greene, Caskey, Musser, Samek and Olson (2008) discover that American middle school teachers report that NCLB has a negative influence on their practices, especially those who teach in a low income area.

Farrel, and Ives (2014) investigate the beliefs and practices of one second language reading teacher. They find that the teacher has complex beliefs and there is

some similarity in his beliefs and practices. Moreover, by articulating and reflection on the beliefs, the teacher becomes more conscious about the meaning and impact of beliefs.

Similarly, Chai (2010) after conducting a qualitative study on seven teachers in Hong Kong posits that all the participants express more or less relativistic epistemic beliefs but their pedagogical beliefs are more knowledge transmission type. The relationship between epistemic beliefs and pedagogical beliefs seem to be effected by teachers' awareness of students' readiness, priorities in the school context, like, tests and examination. Teachers need more conducive environment created by school leaders and policy makers for applying relativistic beliefs in classroom. Some researchers, like, Cincotta-Segi (2011) posits that in spite of potential challenges and barriers, teachers can enact practices that reflect their beliefs. In many cases, a teacher's perceptions of these challenges are important in determining whether the teacher does or does not enact his or her beliefs and their ability to work creatively within the external constraints.

Second, some classrooms are overcrowded, teachers cannot manage the classes and carry out the reformed pedagogies or enact beliefs. Third, organizational level factors which include, lack of essential facilities, lack of suitable culture, busy schedule, lack of proper and prolonged professional development program and type of administration. Fourth, there are some factors which are related to society, for instance, parents' expectations, overloaded content, national standards examination based assessment and policy matters. Last, the type of students also affects the implementation of beliefs in classroom. They are happy with a certain type of activities in classrooms and they do not like the reformed ways of teaching. Moreover, some

students lack the ability for studying in the grade which prevents the teachers to implement their beliefs.

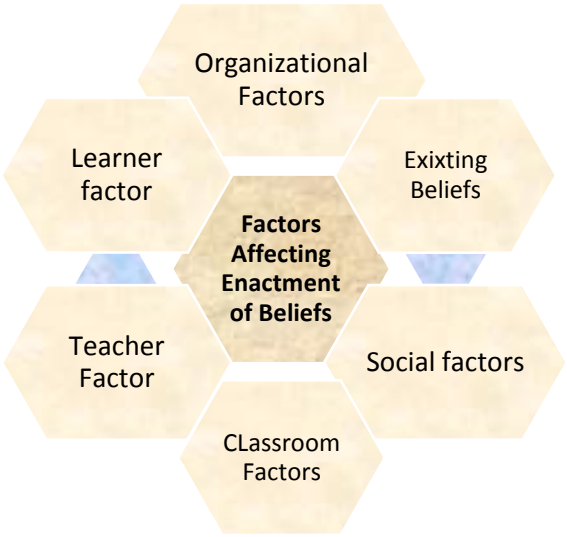

Figure: 3.1 Factors Affecting Enactment of Beliefs

2.24 CONSTRUCTIVIST APPROACHES IN TEACHING AND LEARNING

Theoretical and conceptual changes are taking place in sciences, social sciences and education. In theories of learning paradigm shifts have occurred from behaviorism to cognitivism and then to constructivism (Cooper, 1993). Education reforms need teachers to abandon transmission type of pedagogies and use constructivist approaches wherein students construct knowledge through inquiry (Beck, Czerniak & Lumpe, 2000; Levitt, 2002).

According to Woolf (2015) in behaviorists view, new behaviors are learnt but according to cognitivism, knowledge is making changes in behavior. The focus is given to scientific learning of memory and cognition. Cognitivists view current knowledge, schema of a learner, important for learning. It determines what the learner will pay attention to, perceive, learn, remember and forget. The human mind impacts learning

and it is also impacted by learning. Cognitivists offer different ways for understanding knowledge. On the other hand, constructivism is a broad term used by psychologist, philosophers, educationist and other people. It stresses the active role of learners in building understanding and making sense of information. The roots of the approach are found in the works of Piaget, Barlett, Bruner, Rogoff and John Dewey. Most of the constructivist theories agree on two central ideas:

1. Learners are active in constructing their own ideas. In this approach the learners use information, resources and help from others and improve their mental models and problem solving strategies. Most of the people agree that it involves dramatic change in the focus of teaching. Here the student becomes center of attention and his own efforts for learning are valued (Prawat, 1992).
2. Social interaction is necessary for the process of knowledge construction. The learners interact meaningfully with others in order to improve their mental powers and problem solving strategies. Vygotsky (1978) emphasized that development and learning takes place when there is social interaction, cultural tools and activity.

There are differences among the constructivists but they agree on the four central characteristics: learners construct their own learning, they do not wait for other to transfer knowledge to them; learning of new knowledge depends upon the existing knowledge of learners; learners express their ideas or the teacher starts from what the learners already know; learners exchange their understanding with others and they listen to others. They review their understanding in the process of negotiation. Learners and teachers use real life issues and problems from surrounding life for discussion and application (Bruning, Royce, & Dennison, 1995; Pressley, Harris, & Marks, 1992).

2.25 DIFFERENCES BETWEEN CONSTRUCTIVISM AND TRADITIONAL APPROACHES

According to Sawyer (2006) as cited by Wolf (2014) in constructivist learning, where deep learning takes place, the material in the classroom is related to the real life of the learners in contrast with traditional learning in classroom where material is not directly related to the experiences of learners. In constructivist approaches, new learning is connected to the background knowledge of students while in traditional approaches knowledge is taught in bits and pieces.

Next, in traditional classrooms learning involve memorization while in deep learning learners try for patterns, basic principles, in order to get deeper understanding. Moreover, in traditional approaches learner mostly depend on the text and in the constructivist learning the learners use multiple sources for getting deeper understanding. Furthermore, authorities are considered as the source of learning in traditional approaches and in deep learning the ideas are critically examined. In constructivist approach the students think deeply on their work and progress.

2.26 CONDITIONS FOR LEARNING ACCORDING TO CONSTRUCTIVISTS

All the constructivists agree that knowing develops when learners make sense of their experiences. Learners construct knowledge, knowledge is not the representation of external reality but it is molded according to the individual understanding. Learners share their understanding with other people and experiences and make necessary changes. Many constructivist approaches recommend five conditions for learning as posited by Driscoll (2005) and Marshall (1992) as cited by (Wolf, 2015).

1. Learning is not taking place in isolation but is rooted in complex, realistic, and relevant learning environment. The learning tasks are real life problems and they are complex. The learners apply their learning to the real life issues, teachers facilitate and guide the learners.
2. Social interaction between teachers and students and among students is necessary for learning. It gives an opportunity to review learning, remove misconceptions and improve communication skills of learners. The leaners feel responsible for learning and sharing. Moreover, such interaction develop higher mental processes, it provides an opportunity to the learners to develop their powers of social negotiation and interaction. Students need to develop their power of establishing and defending their positions and at the same time respect the opinion of others.
3. Support multiple perspectives and use multiple representation of content. The students must learn multiple perspectives on any issue or problem. When they have only one perspective, they always oversimplify things and they are not ready to listen to other perspectives.
4. The learners must be aware that learning needs self -interest and self-discovery, it cannot be handed down by others. They have to try for it themselves.
5. The learners need to know that they have an important role to play in their learning. The beliefs and expectations of learners have deep influence on what the learners know about the world.
6. Students have to own their learning, they are responsible for their learning. They should not wait for others (Wolf, 2015).

2.27 CONSTRUCTIVIST PRACTICES

Constructivism is not the name of certain beliefs about teaching and learning but there are certain behaviors which a constructivist teacher displays. First, in constructivism, a teacher works as facilitator in the teaching learning process. Second, he uses different modes of assessment, asks open ended questions and enquires about the background knowledge of learners. Third, learners do different activities and the teacher guides the learners (Lenherdt, 1992).

Brooks and Brooks (1993) also opine that the vision, mission statements of many institutions claim that they develop thinking and problem solver students but actually they do little for creating these qualities in students. The constructivist teachers and institutions have to take certain steps for ensuring constructivist approaches. Constructivists recommend that students frame problem, analyze it and then seek solution to the problem. Students have freedom they can explore and play with the new ideas. Therefore, the teachers have to provide such an environment where the students have the opportunity to frame problems and seek solutions.

Constructivists frame questions in such a way which allow the learner to compare, think, analyze and give arguments for proving or disproving a position. They present, natural and real life issues to the students and ask the students for their opinion. This develops thinking, analyzing and evaluation power of the students. Moreover, they use cognitive terminologies, for instance, compare, contrast, analyze, evaluate, when they frame problems for the students. These are such actions which enable the students to think, dive deeply into text, context and develop understanding. They do not stick to their rigid lesson plan. Their plan, content and strategies are guided by the responses from the students.

Constructivist teachers inquire about the students understanding of the concepts before giving their own concepts. When students hear the correct concept or theory, they stop thinking. Teachers cannot control themselves to tell the correct answers and some students are also impatient. Constructivists encourage dialogue between students and teacher and amongst students. It is social constructivism and students learn through this technique. Teachers encourage learners for classroom discourse. Students get an opportunity to share and listen to others. Dialogue helps in meaning making and concept development. Constructivist teachers ask open ended questions and encourage students to ask questions from their peers. Complex thoughtful questions compel students to dive deeper and ask for elaborated responses. The students get a chance for rethinking and realize their errors and they give enough time to the students for answering the questions posed. Constructivists allow the learners to observe experience and express their idea in the form of metaphor. Lastly, constructivists use learning cycle model for arousing natural curiosity of students.

According to Windschitl (2002) constructivists ask for the experiences and knowledge about the topics and then create an environment whereby they can explain or reform their learning, guide the students to different sources of learning, allow them to discuss the problem with other learners. They are asked to apply their learning in new situations.Teachers use different assessemnt tools and give feedback to the students.

2.28 ASSESSMENT IN CONSTRUCTIVISM

Constructivism in teaching also includes different approaches towards assessment. According to Paulson and Paulson (1994), constructivist approach demands in depth knolwledge. Assessment is not limited to paper pencil test.

Constructivist assessment asks for procedure, prsentation, individual as well as group, journal writing, developing resumes, discussing the relevance of key components, developing drafts for the purpose of testing appropriateness and obtaining meaningful feedback, reviewing the resume based on pertinent input, and working on the resume for final presentation. They use performance based rubric for authentic assessment and make use of portfolio for assessment. Portfolio is a collection of students' work during learning. It shows continuous progress of the students' achievement and provide chance for review and learning from experiences.

Constructivist Teaching and Assessment Activities

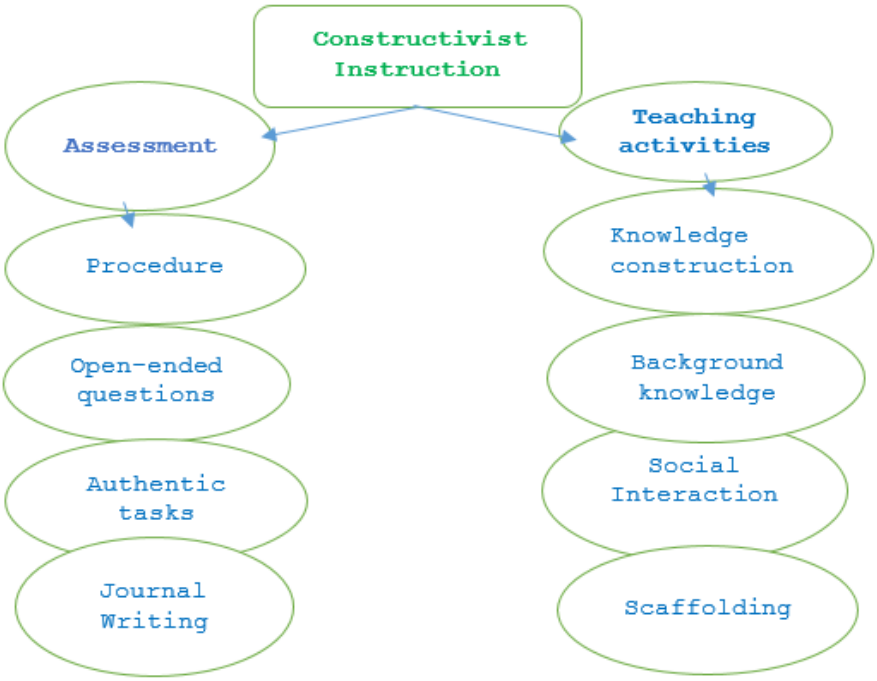

Figure 3.2: Constructivist Instructional Practices

2.29 FACTORS AFFECTING CONSTRUCTIVIST PRACTICES IN CLASSROOM

Everybody admires new approaches in teaching and learning but when it comes to implementation, there are problems. Teachers most of the times do not use them in classroom. Some of the reasons which hinder the implementation are unsupportive administration, rigid curriculum, unsuitable pre and during service training, examination based teaching and education of teachers through traditional approaches (Brooks & Brooks, 1993).

Similarly, Richardson (1997) also identifies two factors that appear to affect the approach teachers and teacher educators take in forming constructivist settings: (1) how much social surrounding is considered as an important factor in learning and individual cognitive development (2) the specific content, subject matter, or discipline. Some disciplines, for instance, mathematics, are more restricted than other subjects by rules, formulae, and procedures. In these subjects, teachers think the problems have one correct answers compared to other subjects, like, literature.

Pre-service teacher cannot use constructivist approaches because these teaching approaches are ‘less structured’, they are more difficult to implement, and they require more complex teaching skills and make classroom management more difficult. Second, constructivist approaches are very different from traditional classroom teaching where the roles of the pupil and teacher are clearly defined. Third, the school supervisor may not recognize or accept these constructivist approaches as valid teaching and learning practices (Smith & Mitchel, 2005).

Richardson (2005) posits that in spite of the differences in the interpretation among constructivists, they agree that constructivism is learning or meaning making. Individual develop understanding on the basis of what they already know and believe

and with what they come in contact. Constructivism describes how people learn? it does not describe a specific method of learning.

There are issues in the enactment of this theory in classroom, for instance, issues in the interpretation amongst constructivists, some say that individual is the sole agent of learning while others say that individual constructs knowledge in a social system. Another issues is the issue of formal knowledge, like, premise, principles on which majority of the people agree. So, the question arises how teachers create dilemma on such topics. When the individuals share their knowledge and it is contrary to the agreed upon knowledge, who decides in that case. Besides, there are socio-economic issues, and contextual issues. All these affect the classroom implementation of constructivist beliefs.

2.30 CONSTRUCTIVISM IN TEACHER EDUCATION

Constructivism is welcomed as a more natural, relevant, productive, and empowering framework for instructing both grade 1-12 and teacher education students (Cannella & Reiff, 1994). Two competing views of child education and purpose of education form the pedagogy of teacher education.

1. The purpose of education in constructivist approach is to educate the individual child according to his interests and social transformation and the reconstruction of society aligned with democratic ideals. This view is based on a theory of human development which keeps the individual in a social context and the subject of study is identified dialectical relationship between the society and the individual (Vadeboncoeur, 2005).

2. Teacher education programs should consist of many opportunities of constructivist teaching experiences for pre-service teachers to gain content and pedagogical skills (Haney & McArthur, 2002).

Constructivist teacher education approach has changed teacher education from learning certain behaviors to a thinking teacher who can make his thinking about teaching in different situations. Students come to teacher education with different beliefs, background, desires and background knowledge. Teacher education must not chalk out rules which are supposedly applicable to each teacher candidate. Each teaching situation is different and full of 'possibilities', teacher has to use his practical reasoning (Novel, 1993).

Constructivist teacher education, generally, reflects two major traditions: the developmental and social re-constructionist traditions (Canella & Reiff, 1994). Programs influenced by the developmental tradition attempt to teach students how to teach in a constructivist, generally, Piagetian, manner. They are typically characterized by substantial direct instruction in theory and practice, often without corresponding opportunities for inquiry, discovery, or self-examination. This approach can easily become very prescriptive. The students will not be able to apply it in future classrooms (Oldfather, Bonds, & Bray, 1994).

Teacher educators should encourage reflection on previously held views of science teaching and learning to promote an understanding of a constructivist perspective on learning and its implication for teaching. They need to examine the prospects and problems of implementing constructivist-based approaches for promoting conceptual change among pre-service teachers; and to examine whether it is feasible for pre-service teachers to implement constructivist-based approaches in the practicum setting. Constructivism does not suggest that a teacher has to learn everything

new. There are many traditional skills which are used in constructivist approaches to teaching. However, the teacher has to follow a new procedure. In teacher education educators should not only teach constructivism but they should also teach the skills and knowledge required for the adoption of constructivism in classroom.

Constructivism demands less structured and more fluid classroom instruction. This skill needs to be learned which is not difficult. A teacher has to be patient. The approach demands pupils change and pupil change is a slow process which needs time. If teacher educators want to implement constructivism, they have to teach necessary skills which are required for the successful implementation. There are many traditional skills which can be used in the implementation of constructivist practices. When the students are used to constructivist approaches, it is easy to teach them but those who are used to traditional methods, it is difficult to teach in a non-traditional way. But change will take place, though slowly. Conceptual change in pre-service education is possible, although, all teachers will not be receptive (Smith & Mitchel, 2008).

Prawath (1992) while discussing reform in education in USA posits that adopting constructivist approach to teaching, teachers have to experience their own conceptual change at least as much as they attend to this process in their students. This can be done when there is complete change in the environment. If teachers are changing their teaching styles they have to go through the process in learning community which they want their students to adopt. It means that they have to undergo themselves the process first, then they will be able to implement them in their classrooms.

2.31 SUMMARY OF THE LITERATURE REVIEW

Studies on epistemological beliefs found that beliefs exert great, though unconscious, influence on teaching and learning. Teachers' beliefs play an important

role in teachers' rejection or adoption of innovation in curriculum at classroom level. In order to adopt the innovation completely, teachers have to review epistemological beliefs, and change will be implemented in the true sense. There is a close relationship between epistemological beliefs and their practices. Research suggests that change or innovation in curriculum will be successful when the change meets the epistemological and teachers' beliefs. If the change does not coincide with the beliefs of teachers, teachers may interpret or mold the change according to their own beliefs and thus the required change may not be realized.

Beliefs work as filter, therefore, it is essential to find out the beliefs and work on them. When beliefs are found then there are various ways, as discussed above, which can be used for the development of beliefs. If the required changes, in beliefs, are not brought, the innovation in curriculum will not be successful. Teachers have to think over their beliefs and bring necessary changes in their beliefs. If they do not bring change, they would adopt changes or innovations in curriculum according to their own designs. Therefore, this study investigated into the personal epistemology, instructional beliefs of teacher educators' practices and it investigated if the beliefs of teachers commensurate with the changes in the teacher education in Pakistan.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research design, methodology, development of research instrument, its pilot testing and details regarding the validity and reliability of the instruments used in this research. The chapter also explains details about population, sample selection and procedures chosen for data collection. Moreover, it shows how the analysis was carried out.

3.2 RESEARCH DESIGN

The research design of the study is co- relational. It involves collecting data to determine whether, and to what degree, a relationship exists between two or more quantifiable variables (Gay, Mills & Airasian, 2015). According to Best (2008) descriptive research deals with conditions or relationships that prevail; practices that exist; beliefs, point of views, or attitudes that are held; processes that are going on; effects that are being felt; or trends that are developing. Descriptive research is concerned with how, what is or what exists is related to some previous event that has influenced or affected a present condition or event.

This is a correlational study and "co-relational studies examine individuals, groups, institutions, methods and materials in order to describe, compare, analyze and interpret the entities and the events" (Cohen, Lawrence & Morrison, 2007). Correlational design was adopted for the current study because the study, first of all, examined the epistemological beliefs; examined the instructional beliefs and found the instructional practices of teacher educators in teacher education institutions. When the

beliefs and instructional practices were determined and analyzed then relationship was investigated among the three main variables: epistemological beliefs, instructional beliefs and instructional practices of teacher educators. Thus, it is clear that correlational research design suited the purpose of the current study.

3.3 RESEARCH METHODOLOGY

The study was quantitative in nature and survey was conducted to collect data. The nature of the questions given in chapter 1 determine that questionnaires were the best tools for collecting data. Questionnaires enabled the researcher to collect data from all quarters of the population. Moreover, questionnaire provided a chance to get point of views from many participants. Interviews or total observation would not have given chance for getting point of view of many potential participants. Moreover, for investigating the epistemological beliefs and instructional beliefs, most of the researchers used questionnaire as a tool for data collection (Hofer, 2000; Jehng, Johnson & Anderson, 1993; Kuhn, Black, Hofer & Pintrich, 1997).

Instructional practices of participants were investigated in two ways: one through self-reported instructional practices by the teacher educators wherein the teacher educators from both strata gave their instructional practices; second, through actual classroom observation of the classroom practices of teacher educators. Each teacher selected was observed for 60 minutes. MCMillan and Schumacher (2014) defines that observation is the seeing and hearing and recording these observations instead of participants self-report responses. Observation may be participative or non-participative. In non- participative observation the observer jots down specific behavior without giving judgments and in participative observation the observer expresses judgments based on his observation.

This research used non- participative observation. The researcher observed the teacher educators in classroom and observed specific behavior, like, "corrects misconceptions on the spot, "gives only test for assessment", "deliver lecture in the classroom most of the time." etc. The researcher noted down the observed behavior if was done 'never', 'rarely' 'sometimes', 'often', or 'always'. In the scale never: 1, rarely: 2, sometimes: 3, often: 4 and always: 5; these specific statements show specific approaches towards teaching so they were interpreted accordingly.

Total thirty four teacher educators from both the strata were selected randomly for observation. The self-reported questionnaire was modified into a tool for classroom observation. The purpose of the observation was to triangulate data on the instructional practices of teacher educators and to get a more authentic data. Instructional practices of only 34 participants and their self-reported instructional practices were correlated.

3.4 POPULATION OF THE STUDY

The population of this study was all male and female teacher educators at RITEs and Departments/ Institutes of Education and Research at the universities in Khyber Pakhtunkhwa. There are 20 RITEs and (09) departments of Education/ IERs in (09) Universities. There were total 62 faculty members in (09) departments of Education/IERs which consisted of 24 female and 38 male members. There were 20 RITEs, (08) for male students and 12 for female students. Total faculty in these RITES was 149. Thus, there were 211 faculty members in RITEs and Universities at the time of data collection.

Table 3.1

Distribution of Population

Institution	Gender		Total
	Male	Female	
RITEs	75	74	149
Universities	38	24	062
Total	113	98	211

*Websites of the Universities in KP

**Directorate of Curriculum and Teacher Education, Abbottabad, KP

The participants for the study were randomly selected from both the strata of the population: Regional Institutes of Teacher Educators (RITEs) and universities. There were total 149 teacher educators in RITEs and 62 teacher educators' in (09) universities Khyber Pakhtunkhwa. So, 111 teacher educators from 20 RITES and 47 teacher educators from (09) universities in Khyber Pakhtunkhwa were randomly selected (List of the institutions is attached as appendices E).

3.5 SAMPLE AND SAMPLING TECHNIQUE

It was a survey research and according to Gay, Mills and Airasian (2015) survey research collects information about a population through a representative sample. Survey research has mainly two designs: cross sectional and longitudinal design. In cross sectional the questionnaire is administered once and in longitudinal study the survey is administered more than once with a significant period of time. This research used cross sectional design, the survey questionnaire was administered once to the representative sample.

The sample frame consisted of two strata: teacher educators from RITES and teacher educators from the universities. As there were 20 RITEs and 09 universities where ADE or B. Ed. honor program was launched, the population was divided into two strata:

1. Teacher educators from RITEs

2. Teacher educators from universities

Each stratum was divided into male and female. Hence, stratified random sampling was used for getting representative sample. For investigating epistemological, instructional beliefs and instructional practices, 75% of the total population from both the strata was selected. As the population is small, therefore, higher percentage is sampled to get a representative population, minimum 30 sample size is essential for co relational study (Gay, Mills, & Airasian, 2015). A sample of 100 is essential for descriptive studies, a sample of at least 50 is essential for the existence of relationship between or among variables (Fraenkel, Wallen, & Hyun, 2012) The researcher got more than hundred participants for descriptive and as well as for finding relationship among the variables.

Thus, 47 (29 male and 18 female) from universities and 111 (56) male and (55) female from RITEs were selected through stratified random sampling in the respective strata. For classroom observation, 20% of the total populations (not including respondents for pilot study) from both the strata were selected through proportionate random sampling in the respective strata. Thus 11 (7 male and 4 female) were selected through convenient sampling from the universities and 23 (12 male and 11 female) were selected from RITEs for classroom observation.

Random sampling technique was used for sampling because it gave every individual the same chance for selection, it ensured representation. Moreover, random sampling was required for much statistical analysis. All members in the respective strata were identified, as the population was not more than 1000 so all the names were written on pieces of papers and put in a hat and the required number was randomly selected (List of institutions Appendix E).

Table 3.2

Sample from RITEs and the Universities

Institutions	Population	Sample (75%)
RITEs	149	111
Universities	62	47
Total	211	158

3.6 DATA COLLECTION TOOLS

3.6.1 Questionnaire for Epistemological Beliefs (EBQ)

This study used the questionnaire developed by Schommer (1990) for measuring general epistemological beliefs (objective number: 1 in the study) which she presented on the basis of her epistemological model (Permission from Shommer Appendix G). The five dimensions of her model are as under:

1. Stability of knowledge: It means if knowledge is stable or changeable.
2. Source of Knowledge: It refers to knowledge being handed down by authority figures and experts at one end or knowledge being acquired through one's validation and reasoning at the other.
3. Certainty of Knowledge: certainty Knowledge refers to whether knowledge is certain, permanent and unchanged for one pole or tentative and ever-changing at the other.
4. Ability to learn: It means ability of learning being innate and fixed at one extreme, while at the other extreme ability is seen as changeable.
5. Speed of Learning: It refers to the capacity that learning is acquired quickly or it is acquired slowly (Schommer, 1990).

The questionnaire used 5 point Likert scale which ranged from ‘Strongly Disagree’ to ‘Strongly Agree’. The questionnaire was used in American context, therefore, it was deemed necessary to make some contextual changes. The questionnaire was piloted and shown to experts in the field of education. After the pilot testing and discussion with the experts, some changes were made to adapt it according to the local environment and teacher educators. There was much use of phrasal verbs in the original questionnaire, they were changed into verbs. Some changes were made to make it suitable for teacher educators, like, students were changed into teachers, ‘text book’ into ‘reading material. There were some difficult words; they were changed into easy words.

After pilot study and expert validity seven items were deleted from the original scale of epistemological beliefs. The items are; 1) “A good teacher's job is to keep his students from wandering from the right track”. 2) “Things are simpler than most professors would have you believe”. 3) “It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes”.4) “If professors would stick more to the facts and do less theorizing, one could get more out of college”. 5) “Truth is unchanging 6) “Nothing is certain, but death and taxes”. 7) “A tidy mind is an empty mind”. Detail of items in each dimension and Sub-dimensions of the epistemological questionnaire has been given in appendix C**.**

According to Schommer (1990) the items are written in such a way that a naïve individual would agree with half of them and disagree with the other half, for example, “You never know what a book means unless you know the intent of the author”. The factor analysis is based on the notion that higher the score, the more naïve the individual is. Therefore some of the item should be recoded. In the original scale the lesser the score the more sophisticated the beliefs. Therefore, some items which a person of

unsophisticated belief will disagree have been reverse scored. Items NO: 2, 4, 7, 10, 12, 13, 15, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 31, 35, 38, 40, 41, 47, 48, 53, 54 were reversed coded.

Next, subset scores were found by adding the items responses for each subset and dividing by the total number of items in that subset. Percentages, means and standard Deviations were calculated for analyzing and finding correlation.

3.6.2 Questionnaire for Measuring Instructional Beliefs

A questionnaire for measuring the instructional beliefs of teacher educators was developed after extensive literature review and discussion with experts and teacher educators from both the strata of the population. Gay, Mills and Airasian (2015) recommend that questionnaire should be attractive, brief, easy to respond and relevant. All these fundamental rules were kept in mind when the researcher was developing the questionnaire. Basically, there were 35 items but after pilot study and content validation by experts many items were deleted. The questionnaire was kept short. It has only 22 items wherein most relevant items have been kept. Two main sections were identified in the survey questionnaire:

1. Constructivist beliefs
2. Traditional or transmission beliefs

Item were developed for measuring both the constructs. In traditional beliefs teaching is seen as transfer of knowledge from an expert to a novice while in the constructivist beliefs, learning is the creation and acquisition of knowledge by the learner through reasoning and justification. Teaching is a provision and facilitation of the learning process rather than transmission of knowledge of teacher educators.

3.6.3 Instructional Practices Scale (IPS)

The scale used for the instructional beliefs of teachers about teaching was adapted as instructional practices questionnaire for the teacher educators. There remained 21 items after pilot study and content validity by 5 experts. These items examined the constructivist and traditional instructional practices of teacher educators. Items 2, 4, 7, 10, 12, 13, 14, 15, 17, 18, 19, 21 measure constructivist practices and items numbers 1, 3, 5, 6, 8, 9, 11, 16, 20 measures transmission type of practices in classroom.

3.6.4 Scale for Observation of Instructional Practices

Gebhard (1999) defined classroom observation as non -judgmental description of classroom events that can be analyzed and given interpretation. The purpose of observation in the context of the present study was not to evaluate the teaching, rather, observing the teachers in action allowed a means of assessing the extent to which the teachers' beliefs and reported practices corresponded to what actually happened in the classroom. It was also a form of data triangulation. Observation checklist was developed from the instructional practices questionnaire. In the observation checklist items 2, 3, 7, 10, 13, 15, 16, 18, 19, 20 and 22 measure constructivist practices and 1, 4, 5, 6, 8, 9, 11, 12, 14, 17 and 21 measured traditional practices.

The researcher observed instructional practices of 34 teachers in order to collect more objective data and compared it with the self-reported practices of the teacher educators. The observation was non-participative because it was less disturbing as compared to participative observation (Gay, 1996). The researcher observed each teacher for 60 minutes in order to observe consistency in their classroom practices. (Research instruments are attached as Appendices B).

3.7 PILOT TESTING

The general epistemological beliefs questionnaire developed by Schummer (1990) was used for measuring epistemological beliefs, instructional beliefs questionnaire was developed after extensive literature review and discussion with the teacher educators for epistemological beliefs, instructional beliefs questionnaire was also used for observation by making some structural changes. After the changes made in these instruments, the validity of these instruments was ensured from a group of expert in the field of teacher education. Pilot testing was conducted on 15 teacher educators in Khyber Pakhtunkhwa (KP) from both the strata of the population. These 15 individuals were not included in the main study.

Table 3.3

Sample and Response Rate for Pilot Study

Institutions	Number of Subjects	Given	Returned	Discarded	Used	Rate
Universities	5	5	5	0	5	100%
RITEs	10	10	10	0	10	100%

Table 3.4

Reliability Statistics of the Epistemological Beliefs Questionnaire

Dimensions	Number of Items	Cronbach's Alpha
1. Structure of knowledge	16	.72
2. Stability of knowledge	07	.60
3. Source of Knowledge	10	.65
4. Ability to learn	13	.73
5. Speed of learning	10	.60
Epistemological Beliefs Questionnaire	56	.82

This reliability coefficient of the instrument is adequate on the criteria given by Griffee (2012) who asserted that "the acceptablity of instrument(s) is based on the

following standard criteria in social science; that is if the alpha value is; α =0.3 or below is threshold, α =0.5 or higher is adequate α =0.7 and above is high".So the reliability of the instrument is acceptable based on the criterian given above.

3.8 VALIDITY AND RELIABILITY OF THE RESEARCH TOOLS

3.8.1 Validity and Reliability of the Instructional Beliefs Questionnaire

Reliability of the instrument was examined by Cronbach Alpha which was .661 for instructional beliefs questionnaire, the Alpha of the constructivist beliefs was .687 and Alpha of the traditional beliefs was .757. The subsets of the instructional beliefs questionnaires were treated as the dimensions of the instructional beliefs questionnaires and for the analysis. The items under each subset/dimensions were tested for their relativity and checked whether any unrelated items had to be extracted to give the instrument more strength and meaning in measuring participants' beliefs and practices.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were measured. The value of KMO was conducted and value of KMO was > .50 and The Bartlett's test of sphericity < 0.05, which meant that the data was ready to apply the factor analysis.

The value of KMO for the instructional beliefs questionnaire was .714, approx. Chi-Square was 706.636 and Bartlett's Test of sphericity df 171 and sig. 000. It is evident that the KMO value for the scale is suitable for factor analysis, similarly, the value of Barlett's tests for the both the scale was significant. Moreover, Component Score Covariance Matrix for each scale was 1. The sample of 140 participants is acceptable for factor analysis as Hatcher (1994) recommends at least 5 respondents for each item in the instrument; the current data fulfills this condition as well.

The factor analysis was applied to each subset/dimension to check whether the items were relevant to each other and to delete those which were not. The principle confirmatory component analysis with an orthogonal varimax rotation was applied with the 2 factors to analyze the validity of the scales. The items with factor loading <0.35 were extracted.

In instructional beliefs questionnaire (IBQ) had 22 items after pilot study. The instructional beliefs questionnaire had 35 items before pilot study, the scale was validated by 04 experts in the area. They suggested that some items on the scale maybe removed/ revised as consequently there remained 21 items on the scale. The scale was validated by factor analysis, after the confirmatory factor analysis (03) items were removed. Thus, there remained 19 items on the scale, 11 items in the constructivist dimension and 08 items in the traditional beliefs dimension. The items numbers 2, 4, 5, 10, 12, 13, 15, 16, 18, 20, 22 measure constructivist beliefs while items 1, 3, 6, 7, 8, 9, 11, 14, 17, 19, 21 measures the transmission type of beliefs.

Content validity was determined by expert in the field. Pilot testing was made before sending the questionnaire to participants. They gave valuable suggestions and all the suggestions were carefully considered.

Table 3.5

Factor loading of Instructional Beliefs Questionnaire

Item # in Scale	Constructivist Beliefs	Traditional Beliefs
3		.716
14		.706
5		.642
19		.593
1		.478
8		.477

9		.471
17		.437
4	.775	
20	.636	
7	.571	
12	.571	
18	.559	
13	.548	
2	.559	
10	.504	
15	.407	
22	.405	
16	.616	

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Table 3.6

Reliability Statistics of the Instructional beliefs Questionnaire

Beliefs	Number of Items	Cronbach's Alpha Standardized Items
Traditional	8	.757
Constructivist	11	.687
Instructional Beliefs Scale	19	.661

3.8.2 Validity and Reliability of the Instructional Practices Questionnaire

Cronbach alpha was calculated for the reliability of the instrument. The Cronbach alpha of the constructivist dimension was .741 and the Cronbach alpha value of the traditional practices items was .611 which is acceptable.

The KMO value for the instructional practices was .716, approx. Chi-Square was 452.779, Barlett's test of Sphericity df was 120 and Sig. was .000. It is evident that the KMO value for the scale is suitable for factor analysis. Similarly, the value of

Barlett's tests for the scale was significant. Moreover, Component Score Covariance Matrix for each scale was 1. The sample of 140 participants is acceptable for factor analysis as Hatcher (1994) recommends at least 5 respondents for each item in the instrument, the current data fulfills this condition as well. Initially, there were 35 items in questionnaire, after pilot study there remained total 21 items.

The factor analysis was applied to each subset/dimension to check whether the items were relevant to each other and to delete those which were not. The principle confirmatory component analysis with an orthogonal varimax rotation was applied with the 2 factors to analyze the validity of the scales. The items with factor loading <0.35 were extracted.

Table 3.7

Factor loading for the Instructional Practices Questionnaire

Item No:	Traditional Practices	Constructivist Practices
1	.472	
3	.482	
6	.602	
8	.442	
9	.548	
11	.506	
13	.515	
4		.722
12		.622
10		.418
15		.648
7		.449
17		.613
18		.564
19		.675

Note: Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Table 3.8

Reliability Statistics of Instructional Practices Questionnaire

Classroom Practices	Number of Items	Cronbach's Alpha on Standardized Items
Traditional Instructional Practices	08	.611
Constructivist Instructional Practices	11	.74
Cumulative	19	.67

3.8.3 Validity, Reliability and Trustworthiness of the Research Tools

According to Gay, Mill and Airasian (2015) Validity refers to the degree to which a test measures what it is supposed to measure and it allows appropriate interpretation of scores.

Validity is important in all forms of tests. Content validity of the instruments was determined by experts in the field. They went through the instruments, objectives and gave valuable suggestions which were incorporated in the instruments.

Proper time also matters in the collection of data collection. The researcher gave proper and enough time to data collection. The data collection started in March, 2016. The researcher met 110 participants and collected data from them. The rest of the participants were not available due to one or another reason. Therefore, the questionnaire was given to their colleagues with necessary instructions and guidance. A self-addressed envelope was attached with the questionnaire. The participants sent the questionnaire to the researcher. In between the participants were called after seeking permission. They were requested to send the questionnaire and answered their questions if any. The process of data collection was completed in October, 2016. It means that

enough time was given to the data collection. It also ensured validity when enough time is given to data collection.

Data about instructional practices was validated by triangulation. The teacher educators gave their classroom practices through a questionnaire and later on the researcher observed 34 teachers during their teaching in classrooms. Thus, the practices of teachers were double checked.

In order to ensure validity in the instrument, the process of data collection, instrument development and raw data was discussed with many researchers in the study area. Moreover, Gay, Mills and Airasian (2015) say that unclear test direction, confusing and ambiguous test items, difficult vocabulary, complex sentences, cheating are threat to validity in a test. As for this research is concerned, the researcher give very clear instruction. During the pilot study some ambiguity in instruction was pointed out, the researcher removed that ambiguity. All the items of the test were read for many times. They were shown to other researchers and experts in language. And they helped in removing the ambiguity in the test items. As said earlier, difficult vocabulary was changed into easy words, phrasal verbs were changed into words and above all epistemological questionnaire was translated into Urdu which made the understanding of the items easy.

3.9 DESIGN OF THE INSTRUMENTS

Each questionnaire had the following parts:

a. Title of the Questionnaire: it tells what the questionnaire was about.
b. Definition of the Title: The title was explained so that the respondents may get a clear idea.
c. Salutation to the participants.

d. Demographic Profile. It was meant to get the identity of the institute and respondents. The respondents were supposed to give the following details: Name, age group gender, Institution's name and academic and professional qualification.

e. Response Rubric. Each respondent was instructed how to complete the questionnaire. The following instructions were given:

   Dear participants, there is no right or wrong answers for the following statements. The researcher just wants to know what you really believe or practice. For each statement tick mark the answer sheet for the degree to which you agree or disagree.

f. Body of the Questionnaire: This part of the questionnaire consisted of the statements to which the respondents responded.

g. End of the Questionnaire: Before the conclusion of each questionnaire, there was a space for the respondent's signature followed by expression of gratitude "Thank you for completing the questionnaire"

3.10 THE COVER LETTER

The consent letter is an essential element of questionnaire. It is of immense importance and has a great influence on the response rate. Gay (1996) posits that every questionnaire must be accompanied by a covering letter that must tell the purpose of questionnaire and give logic for the purpose of the research which needs their valuable time. The consent letter should have the following necessary features:

1. It must be to the point, clear and written only to the respondent.
2. The letter should mention that the results will be shared once the research work is completed.

3. The researcher should ensure confidentiality for the information which is given to the researcher.
4. The letter must be signed.
5. The letter should mention how the filled questionnaire would be returned once it is filled.
6. The researcher should send a self-addressed envelope for returning the filled questionnaire.

Each questionnaire of the current research fully followed the instructions given above for each questionnaire which was sent or given to the participants. The letter was written in a formal way, language was simple and clear, the purpose was explained and surety was given to the respondents for confidentiality. Epistemological beliefs and instructional beliefs were briefly explained so that respondents may have a clear conception of the topics under research. The letter carried detailed identity of the researcher and supervisors. A self-addressed envelope was also given/ sent when necessary (Appendix D).

3.11 DATA COLLECTION PROCEDURE

3.11.1 Administration of the Questionnaire

The researcher had to collect data from (09) universities and 20 RITEs, the researcher opted for personal administration of the questionnaire because it provided an opportunity to explain the questionnaire to the participants. Permission was sought from the Directorate of Curriculum and Teacher Education, Abbottabad, KP (Appendix H). It was not difficult for the researcher to visit the institutions; all the participants were known to the researcher by one way or another way and to get more reliable quick response from the participants. However, there were (03) RITEs where it was difficult

for the researcher to visit personally. The questionnaires were sent by post to the participants. Before sending the questionnaire the participants were called on their official or personal numbers and discussed the purpose of the questionnaire and their consent was requested.

When the researcher visited the institutions, some of the teachers did not have time to fill in the questionnaire and some were on leave or duties at other places, especially in RITEs. So their colleagues were handed over the packets of questionnaires with a self- addressed envelope.

Such respondents were given 2 weeks' time, when they did not respond they were contacted on their cell phones or official contact number where possible or they were sent letters or mails. This process enabled the researcher to get maximum response from the participants. Response rate is given in table # 3.8.

Table 3.9

Sample and Response Rate

Institutions	*No of Subjects*	*Questionnaire*			*Response*	
		Given	*Returned*	*Discarded*	*Used*	*Rate*
Universities	*47*	*47*	*46*	*0*	*46*	*92%*
RITES	*111*	*111*	*99*	*5*	*94*	*94%*

Table 3.10

Sampling for Classroom Observation

Institutions	Number	Male Faculty	Female Faculty
Universities	14	11	3
RITEs	20	11	9
Total	34	22	12

3.12 DATA ANALYSIS

The process of data analysis started with the feeding of data to the system, all the variables were labelled. When the data were entered, it was checked for any missing values and confirmed the accuracy of the data. There were a few missing values, the questionnaires were checked again for finding if the participants had given the responses. If the response was there, it was incorporated, if it was not given in the data collected, then mean value for the item was added. Next, as mentioned earlier there were some items in negative forms. They were identified and they were all recoded in the software.

The next step was to adopt the descriptive statistics to provide an overall view of the data and the sample with a summary of the measures. The information provided in this step, for example the frequency distributions, the means, the variance and standard deviations, acted as indicators for the researcher regarding the data of the study.

The 56 items epistemological beliefs questionnaire (EBQ) used a 5 point Likert scale (1= Strongly Disagree, 2=Disagree, 3= N, 4= Agree, 5= Strongly Agree) for finding epistemological beliefs of teacher educators. A high score on the EBS represents less sophisticated epistemological beliefs and lower score represents a high sophisticated understanding of epistemology. Beliefs may be sophisticated when participants believe that knowledge is uncertain, complex, source of knowledge is reasoning and acquisition, learning is not a quick process and it is not innate but everybody, if try, may learn. On the other hand, beliefs may be unsophisticated (Naïve) when participants believe that knowledge is certain, simple, source of knowledge is authority, learning is a quick process and it is innate, everybody may not learn

(Shommer,1990).

Similarly, Instructional Beliefs Questionnaire (IBS) used a 5 point Likert scale (1= Strongly Disagree, 2= Disagree, 3= N, 4= Agree, 5= Strongly Agree, was used for the beliefs of teachers about teaching and learning. Percentages of IBS were found and they were analyzed in order to find out the beliefs of teacher educators. Mean of both the constructivists' ad transmission type of beliefs was calculated.

Instructional practices of teacher educators were measured by a 19 items Instructional Practices Questionnaire (IPQ) using a 5 point Likert scale (1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always) was used for collecting data about instructional practices of teacher educators. Percentages of IPQ were found and they were analyzed. Mean of both the constructivist and transmission practices were compared.

The Pearson Product Moment Co-efficient was used for finding out the relationship of EBs, IBs, IPs. The researcher observed 34 teachers for instructional practices. The data collected from 34 teachers were compared with their self-reported Instructional Practices. Mean scores obtained through both the tools were compared.

Pearson r is used for finding correlation coefficient. There are many methods of calculating correlation coefficient but the most common technique is the product moment correlation coefficient, Pearson r. It is used when the variables are interval or ratio. Moreover, Pearson r gives more precise estimation of correlation, it is used even when other methods could also be applied. If the data for at least one variable is expressed as rank or ordinal, the appropriate correlation coefficient will be Spearman rho (Gay, Mill & Airasian, 2015).

3.13 RESEARCH ETHICS

Data were collected from teacher educators in RITEs and universities. First of all permission was sought from the Directorate of Teacher Education and Curriculum Development (DCTE), Abbottabad (Copy attached at annexure E). All the heads of the departments of education/ institutes of education and research were requested for permission for data collection from the university faculty. The participants were given all necessary information about the nature of the study. All the participants were given a consent form and before giving the questionnaire, they filled it and gave their consent. The participants were ensured that the information of the participants will be kept confidential; data obtained will be used only for the sake of research and nothing more. Their names would not be mentioned in the dissertation or later in any publication from the dissertation. Moreover, participation in the study was voluntary; they could withdraw at any point during the study.

3.14 SUMMARY OF THE CHAPTER

The chapter presented research design, methodology and research tools, how the tools were developed and what changes were made in the adapted tools, data collection process, pilot study and data analysis statistics. It also explained rationale for the design and methodology of the study. Moreover, it explicated population, sample technique, the method of data collection and data analysis. At the end research ethics which were observed in data collection from the respondents, have been provided. The next chapter provides results of the research work.

CHAPTER 4

DATA ANALYSIS

4.1 INTRODUCTION

This chapter shows data analysis. In the first part demographic information about the participants and their institutions has been presented. In section B epistemological beliefs have been analyzed by finding percentages, means and Standard Deviations of the beliefs. It covers objectives No.1. In part C analysis of instructional beliefs has been presented which covers objective No: 2 and in section D instructional practices of teacher educators, related to objective No: 3 have been analyzed. Moreover, correlation among all the variables has been performed for showing association among the variables. At the end data collected from classroom observation of teacher educators have been analyzed and it has been compared with their self -reported instructional practices of teacher educators.

Part A Section 1: Demographic Characteristics

This section shows the demographic information about respondents related to their institution, gender, academic qualification, professional qualification, age and teaching experience.

Table 4. 1

Distribution of the Respondents on the basis of Institution

Category	Number	Gender		Percentage
		Male	Female	
RITEs	93	68	35	66
Universities	47	31	16	34
Total	140	99	51	100

Data were collected from teacher educators from Regional Institutes of Teacher Education and universities. Table 4.1 shows that there were total 140 out of 150 teacher educators who responded to the questionnaires, 68 (66%) teacher educators belonged to RITEs, 68 male and 35 female teacher educators. There were 47 (34%) teacher educators from universities, 31 male and 16 female.

Table 4.2

Gender Distribution of the Respondents on the Basis of Institution

Gender	Number	Percentage
Male	84	60
Female	56	40

Table 4.2 delineates the gender of participants, 60 % respondents were male and 40 % female teacher educators.

Table 4.3

Distribution of Respondents on the Basis of Academic Qualification

Qualification	Frequency	Percentage
M. Sc.	44	31
MA	66	47
M. Phil	14	10
PhD	16	11
Total	140	100

Table 4.3 shows academic qualification of participants, 31% respondents held a Master degree in Science (M.Sc.), 47% had a Master of Arts (MA) and 14% teacher educator held Master of Philosophy Degrees (M.Phil.) and 16% respondents had Doctor of Philosophy degree.

Table 4.4

Distribution of Respondents on the Basis of Professional Qualification

Professional Qualification	Frequency	Percentage
B. Ed.	22	16
M. Ed.	72	51
M. Phil in Education	18	13
PhD in Education	28	20
Total	140	100

Table 4.4 presents the professional qualification of teacher educators. It shows that 22 (16%) held Bachelor of Education degree (B.Ed.), 72 (51%) had Master of Education (M.Ed.) degree, 18(13%) had Master of Philosophy degree and 28 (20%) had PhD degree in education.

Table 4.5

Distribution of Respondents on the Basis of Age

Age Ranges	Frequency	Percentage
24 – 30	5	4
31 – 40	44	31
41 – 50	55	39
Above 50	36	26
Total	140	100

Table 4.5 presents age of the respondents. Out of 140, 4% respondents were between the age of 24-30, the age of 44 (31%) respondents ranged between 31-41, 55 (39%) fell between 41-50 and 35 (26%) were above 50 years old.

Table 4.6

Distribution of Respondents on the Experience

Experience	Frequency	Percentage
Less than a year	1	1
1 – 5	14	10
6 – 10	22	16
More than 10	103	73
Total	140	100

Table 4.6 delineates the teaching experience of teacher educators. Only one 1 teacher had less than a year teaching experience, 14 (10%) had 14 years teaching experience while 22 (16%) had 6 to 10 years teaching experience and majority 103 (73) had more than 10 years of teaching experience**.**

SECTION B OBJECTIVE NO: 1 EPISTEMOLOGICAL BELIEFS ANALYSIS IN PERCENTAGES

Mean score criteria for interpretation of Epistemological Beliefs

S#	Mean Score	Category
1	1-9	High sophisticated beliefs
2	2-9	Low sophisticated Beliefs
3	3-9	Low unsophisticated beliefs
4	4-9	Highly unsophisticated beliefs

Table 4.7

Dimension: Structure of Knowledge -Seeking Single Answer

S.NO	Items	SD%	D%	NS%	A%	SA%	M	SD
30	Most words have one clear meaning.	7	29	26	37	1	3.05	.96
14	The most important aspect of scientific work is precise measurement and careful work	3	8	4	59	26	3.99	.917
16	By the time one becomes a teacher educator one should know the best method.	2	6	4	51	37	4.14	.905
52	The best thing about science course is that most problem shave only one right answer.	0	26	14	50	10	3.44	.99

51	I really appreciate instructors who organize their lessons precisely and then stick to their plan.	0	9	8	85	35	4.06	.76
19	You never know what a book means unless you know the purpose of the author	1	28	14	42	15	2.59	1.09
20	The most import part of scientific work is original thinking	0	2	4	59	35	1.73	.641
27	A sentence has little meaning unless you know the situation in which it is spoken.	1	6	4	60	29	1.92	.84
	Average	1	13	9	54	23	3.11	.334

Strongly Disagree (SA) = 1, Disagree (D) = 2, Not Sure (NS): 3 Agree (A) = 4, Strongly Agree (SA): 5

Table 4.7 is related with the structure of knowledge and data shows that majority of the participants (77%) agreed that structure of knowledge is simple.

It shows that majority of the teacher educators agreed that structure of knowledge is simple. The mean value (3.11, Standard Deviation: 33) of data regarding structure of knowledge- seeking single answer showed that teacher educators believed in single answer, they did not have sophisticated beliefs about the structure of knowledge. Their epistemological beliefs were low unsophisticated beliefs about the structure of knowledge.

Table 4.8

Dimension 1 Structure of Knowledge - Avoid Integration

S#	Item	SD	D	NS	A	SA	M	S.D
12	I try my best to connect information from different chapters of book.	0	3	3	76	18	1.90	.56
34	When I study, I look for the specific facts.	1	14	7	69	9	3.70	.86
15	To me studying means getting the big ideas from the text, rather than details	0	31	10	48	11	2.61	1.04
28	Being a good student generally involves memorizing facts.	9	44	18	24	5	2.76	1.09
31	I think a person is intelligent who forgets details but gives a new idea when reads a text.	31	8	51	19	3	3.43	.97
48	A really good way to understand a textbook is to re-organize the information according to your own personal scheme.	10	59	18	13	0	2.35	.83
56	You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic.	6	56	23	14	1	2.48	.83
33	Learning definitions word-for-word is often necessary to do well on tests	4	47	20	27	2	2.76	.97
	Average of the sub Dimension	7	33	18	36	6	2.74	.74
	Accumulative mean of Structure of Knowledge	4	23	14	45	14	3.00	.89

Table 4.8 shows that majority (42%) agreed that they did not avoid integration for learning. They had unsophisticated beliefs about structure of knowledge. The mean value (Mean: 2.74) of the beliefs about structure of knowledge- avoid integration, also showed that as a whole teachers had low sophisticated beliefs about this dimension of knowledge.

Accumulative mean value, 3.00 of the dimension ‘structure of knowledge’ showed that teachers had low unsophisticated beliefs.

Table 4.9

Dimension 2: Stability of knowledge- Avoid Ambiguity

S#	Item	SD %	D %	NS %	A %	SA %	M	S.D
24	I feel very good when I think about issues that experts cannot agree on-	7	48	22	21	1	2.62	.94
37	I don't like stories that don't have an ending	2	11	11	54	21	3.81	.97
39	It's a waste of time to work on problems which have no possibility of coming out with a clear-cut answer.	5	39	12	38	6	3.01	1.09
	Average	5	33	15	38	9	3.14	.64

Table 4.9 indicates data about dimension (2) 'stability of knowledge' which finds if the teacher educators view knowledge as certain rather than tentative. Majority (47%) on average 'Agreed' that they avoided ambiguity in knowledge. Further the mean score (3.14) shows that the beliefs of teacher educators and un-sophisticated about the dimension.

It is concluded that that teachers believed in avoiding ambiguity and they believed in the stability of knowledge which mean that the beliefs of educators in this sub-dimension were unsophisticated.

Table 4.10

Dimension (2) Stability of knowledge- Knowledge is certain

S#	Item	SD	D	NS	A	SA	M	S.D
2	The only thing that is certain is uncertainty itself.	8	36	27	23	6	2.82	1.05
10	If one tries hard enough, one can find the truth almost completely.	21	59	15	5	0	2.04	.74
54	Today's facts may be tomorrow's fiction.	9	53	14	20	4	2.55	1.02
18	Scientists can finally get to the truth.	.7	9	16	53	21	3.85	.88
	Average	9	39	18	25	8	2.81	.44
	Accumulative mean of Stability of knowledge	8	36	17	31	8	2.95	.95

Table 4.10 shows dimension 2, which enquires if teachers view knowledge as tentative or certain. Average response shows that (48%) teacher educators disagreed that knowledge is certain. Further, the mean score (2.95) shows that the beliefs of teacher educators are low - sophisticated about the dimension.

As a whole (44%) teacher educators disagreed that knowledge was certain. It is concluded that educators did not believe in the certainty of knowledge and their beliefs were low level sophisticated.

Table 4.11

Dimension (3) Source of Knowledge - Depend on Authority

S#	Item	SD	D	NS	A	SA	M	S. D
5	How much a student learns in a school mostly depend on the quality of teachers in that school.	1	15	9	48	27	3.84	1.03
26	Solving of difficult concept.	6	29	10	44	11	2.74	1.16
32	I consult experts when I face problem in life.	1	16	12	57	14	3.69	.93
36	Acceptance of answers from experts.	2	18	24	54	2	3.34	.89
	Average	3	20	14	49	14	3.40	.50

Table 4.11 shows the beliefs of respondents about the source of knowledge. It means if the educators believe that the source of knowledge is authority or reasoning/ evidence. The data showed that majority (63%) and mean score of the sub-dimension shows that teacher educators strongly agreed that authority was the source of knowledge. The mean score showed that beliefs were unsophisticated about this sub-dimension.

It is summed up that educators believed in authority as a source of knowledge. Teacher educators had low unsophisticated beliefs about this dimension of knowledge.

Table 4.12

Dimension (3) Source of Knowledge- Criticize authority

S#	Item	SD	D	NS	A	SA	M	S.D
11	Challenging is over-confidence.	0	13	13	55	19	3.81	.89
06	Believing everything one read.	7	39	27	23	7	2.79	.995
03	For success one need not to ask questions.	39	41	7	12	0	1.94	1.00
07	Knowing teachers' knowledge	9	48	18	20	6	2.66	1.07
40	Evaluate the correctness of information	20	61	15	4	0	2.04	.74
41	Questioning advice from experts	10	76	8	6	0	2.08	.64
	Average response	14	46	15	20	5	2.55	.38
	Accumulative mean of "Source of knowledge"	10	36	14	32	8	2.89	.93

Table 4.12 reflects data about dimension 3, source of knowledge. Average response showed that majority (60%) teacher educators disagreed with not criticizing authority. It means that majority of teacher educators did not agree that authority should not be criticized. The accumulative mean value (2.89) reflected that educators had low sophisticated beliefs about the dimension, 'Source of knowledge'.

Table 4.13

Dimension 4 - Ability to learn- ability to learn is innate

S#	Item	SD	D	NS	A	SA	M	StD
8	The ability to learn is innate	4	23	13	43	17	3.46	1.14
42	Some are good learners.	0	6	2	60	32	4.19	.73
49	Average students remain "average"	17	69	9	3	1	2.02	.71
50	Experts have a special gift.	1	4	11	62	22	3.98	.80
	Average response	6	25	9	42	18	3.41	.49

Table 4.13 shows that the beliefs of teacher educators if they believe that the "*ability to learn is innate"* or it can be acquired. A majority of the teacher educator 60% teacher educators agreed that ability to learn was innate. The mean value (3.41) revealed that educators had unsophisticated beliefs.

It is surmised that teacher educators believed that ability to learn is innate. Beliefs were unsophisticated in this dimension.

Table 4.14

Dimension4 - Ability to learn- Success is Unrelated to Hard Work

S#	Item	SD	D	NS	A	SA	M	StD
23	Genius is 10% ability and 90% hard work.	15	29	25	28	3	2.74	1.10
29	Wisdom is how to find answers	26	60	10	4	1	1.93	.75
38	Success in studies takes much hard work**.**	38	53	5	4	1	1.76	.76
43	Intelligent need not to work hard	6	46	9	35	4	2.82	1.08
	Average response.	21	47	12	18	2	2.31	.52

Table 4.14 indicates data about the ability to learn is unrelated to hard work. On average 68% teacher educators disagreed that that success was unrelated to hard work. It shows that majority of the teacher educators disagreed with the statement that success is unrelated to hard work. The mean value,2.31 as per criteria showed that beliefs were sophisticated. It is concluded that ability to learn is related to hard work showed that educators believed in hard work.

Table 4.15

Dimension 4 – Ability to learn- Can't Learn How to Learn

S#	Item	SD	D	NS	A	SA	M	SD
13	Successful learners know how to improve learning.	14	57	19	9	1	2.27	.86
04	A course in study skills would be probably valuable for learning.	29	60	7	4	0	1.87	.718
22	Students have a lot of control over how much they can learn from a textbook.	11	63	11	14	0	2.28	.85
25	Everyone needs to learn how to learn.	36	56	6	2	0	1.74	.66
55	Self-help books are not much help.	10	59	19	11	0	2.32	.80
	Average response	20	59	12	9	0.2	2.10	.40
	Accumulative mean of 'ability to Learn'.	16	45	11	21	6	2.56	.84

Table 4.15 shows data about dimension 4 which means if the learning skills improve learning or not. A clear majority (59%) disagreed that they could not learn how to learn. It shows that majority of the teacher educators disagreed that learning cannot be improved with learning skills. The mean value, 2.10 shows teacher educators had low sophisticated beliefs about this sub dimension of learning. Learners can improve their learning by learning the skill.

As a whole majority (61%, mean value: 2.56) revealed that teacher educators had low epistemological beliefs. It means that they did not believe that learning was innate, hard work was unrelated and that they could not improve their learning by improving learning skills.

Table 4.16

Dimension (5) - Speed of Learning- Learning is quick

S#	Item	SD	D	NS	A	SA	M	SD
9	Successful students understand lessons fast.	0	7	11	56	25	3.99	.80
44	Working hard benefit intelligent learners.	7	63	11	19	0	2.42	.88
1	I understand things when I hear it for first time.	7	23	22	49	2	3.24	.94
35	Learner should try for learning even if they do not learn in short time.	31	67	2	0	0	1.71	.49
53	Learning is a slow process.	31	56	5	7	0	1.87	.79
	Average response	15	43	10	26	5	2.64	.39

Table 4.16 shows data about dimension 5 which enquires if the teacher educators believed that learning is a quick process or it is a slow process of acquisition. Average response showed that majority (58%) teacher educators strongly disagreed that learning was a quick process. The mean value, 2.64 shows that beliefs of educators are low sophisticated.

It is concluded that majority of the teacher educators did not agree that learning is a quick process. As a whole the respondents had sophisticated beliefs that learning may take place when learners keep on working.

Table 4.17

Dimension (5) - Speed of Learning- Learn First Time

S#	Item	SD	D	NS	A	SA	M	SD
21	I learn more when I read a book for the second time.	33	59	6	3	0	1.78	.67
17	Reading a difficult book chapter again and again will not be helpful in understanding.	22	58	11	9	0	2.06	.82
46	You will get during the first reading almost all the information from a textbook.	12	54	18	15	1	2.38	.90
	Average response	22	57	12	9	.3	2.07	.50

Table 4.17 indicates data about dimension 5 (Speed of learning). It was found that majority (79%) of teacher educators disagreed that they could learn the first time. The mean value (2.07) reflects that majority of the teacher educators disagreed that they learn the first time. It is summed up that learners believed in the slow process of learning. They had low sophisticated epistemological beliefs about this aspect of knowledge.

Table 4.18

Dimension (5) Speed of Learning-Concentrated effort is a waste of Time

S#	Item	SD	D	NS	A	SA	M	StD
47	Usually you can understand difficult concepts if you remove all outside interruptions and really concentrate.	15	66	15	4	0	2.07	.66
45	If a person tries too hard to understand a problem, he/she will most likely get confused	8	50	22	19	0	2.55	.91
	Average response	11	58	19	12	0	2.31	.58
	Accumulative mean of 'Speed of learning'.	17	50	12	18	3	2.39	.78

Average response given in table 4.18 shows that majority (69%) teacher educators disagreed that "concentrated effort is a waste of time. As a whole (67%) teacher educators disagreed that learning was a quick process. The mean value (2.39) shows that educators had low sophisticated beliefs.

It is concluded that teacher educators have low epistemological beliefs as reflected by the cumulative mean scores of EB which is M: 2.75, SD: .188.It showed that teacher educators as a whole had low sophisticated epistemological. They were not highly sophisticated beliefs.

OBJECTIVE NO: 2 INSTRUCTIONAL PRACTICES OF TEACHER EDUCATORS

Table 4.19

1. Description of Constructivist Beliefs

S#	Items	SD %	D %	NS %	A %	SA %	M	SD
2	Learning occurs when PT have many opportunities to find answers to questions about a lesson.	2	3	1	73	21	4.07	.72
4	A teacher educator should facilitate prospective teachers to interact with each other in classroom for learning.	7	4	4	50	41	4.28	.76
7	Instruction should be flexible to accommodate individual differences among prospective teachers.	1	7	2	59	31	4.11	.84
10	Effective teacher educators encourage more discussion in classroom among PT on the learning objectives.	1	4	6	64	25	4.07	.76
12	Learning occurs when prospective teachers have many opportunities to discuss lessons with each other.	7	3	6	54	36	4.23	.74
13	Construction of knowledge from learning experiences should be encouraged instead of knowledge transmission.	1	8	4	57	30	4.06	.88
15	Open ended questions should be asked to assess understanding.	1	16	6	54	45	3.81	1.01
16	Teacher educators should use different instructional strategies to meet the individual needs of learners.	1	0	1	52	45	4.39	.66
18	Effective teacher educators encourage more practical activities in classrooms.	0	3	3	49	45	4.36	.68
20	Teacher educator should stimulate and value the interpretation of PT.	1	2	5	66	26	4.15	.66
22	Teacher educator needs to link teaching to real classroom situation.	1	1	1	50	46	4.39	.71

2	5	3	55	35	4.17	.433

Average response

Number: serial number in scale SD: Strongly Disagree D: Disagree NS: Not sure A: Agree SA: Strongly Agree

Table 4.21 shows that majority (90%, mean value: 4.17) teacher educators agreed that they believed in constructivist instructional practices.

It is summed up that that majority of the teacher educators believed in constructivist instructional beliefs.

Table 4.20

Description of Traditional Beliefs

S#	Items	SD%	D%	NS%	A%	SA%	M	SD
1	Correcting learning misconceptions immediately instead of asking learners to correct them.	8	32	3	39	18	3.25	1.29
3	Effective teaching occurs by delivering lectures most of the time.	9	51	15	19	6	2.54	1.02
5	Learning means remembering.	8	44	11	33	4	2.81	1.11
6	Reading only one material for learning is important.	23	63	6	6	2	2.00	.84
8	Only tests are enough for assessment in classroom	18	67	10	4	2	2.05	.78
9	TE should prescribe certain methods of teaching for every situation.	7	24	11	46	11	3.31	1.16
11	Keeping PT limited to the desks during instruction	15	56	6	22	9	2.30	.942
14	Providing accurate and complete knowledge is teaching.	6	56	6	22	9	2.72	1.15
17	The major role of a TE is to impart knowledge.	2	10	4	58	26	3.95	.94
19	Effective learners learn without using their background knowledge	10	61	14	11	4	2.39	.96
	Average response	10	47	8	26	9	2.76	.55

Note: Number: serial number in scale SD: Strongly Disagree, D: Disagree NS: Not sure, A: Agree, SA: Strongly Agree

Table 4.20 indicates that 57% with mean value 2.76 of teacher educators disagreed with the traditional instructional beliefs. It is concluded from the instructional beliefs of teacher educators that majority of them had constructivist beliefs.

OBJECTIVE NO: 3 INSTRUCTIONAL PRACTICES OF TEACHER EDUCATORS

Mean Score Criteria as given by Gay, Mills and Airasian (2015)

S#	Range of Mean Score	
1	4.51 to 5.00	Always
2	3.51 to 4.50	Often
3	2.51 to 3.50	Sometimes
4	1.51 to 2.50	Rarely
5	1.00 to 1.50	Never

Table 4.21

Description of Traditional Classroom Practices

S#	Items	N%	R%	S%	O%	A%	M	SD
1	Correct learning misconceptions immediately instead of asking learners.	6	9	31	32	22	3.56	1.108
3	Deliver lecture in the classroom most of the time.	5	9	44	26	16	3.41	1.024
5.	Asking for remembering material.	0	8	18	33	39	3.99	1.04
6	Encourage prospective teachers to read only one material.	36	31	24	4	5	2.11	1.092
8	Give only tests for assessment in classroom.	17	36	31	12	4	2.49	1.028
9	Prescribe certain methods of teaching which must be applied in every situation in classrooms.	10	21	24	27	18	3.22	1.247
11	Keep prospective teachers limited to their desks during instruction	34	18	26	14	9	2.46	1.311
13	Provide students with accurate and complete knowledge instead of creating knowledge	7	17	36	31	8	3.16	1.034
	Average response	14	19	29	22	16	2.91	.614

Number: shows actual number of items in the questionnaire N: Never R: Rarely, S: Sometimes, O: Often A: Always M: mean SD: standard deviation

Table 4.21 shows that majority of the teacher educators sometimes used traditional practices. It was summed up that the 29% educators sometimes used

traditional Instructional Practices. The mean value (2.91) shows that teacher educators sometimes used traditional instructional practices.

Table 4.22

Description of Constructivist Classroom Practices

S#	Items	N	R	S	O	A	M	SD
4	Facilitate PT to interact with each other in classroom.	0	0	7	16	51	4.29	.827
7	Make instruction flexible enough to accommodate individual differences.	1	1	11	52	23	4.15	.786
10	Encourage more discussion.	2	7	14	50	31	4.25	.891
12	Encourage construction of knowledge from learning experiences	7	4	14	50	31	4.07	.828
15	Use different instructional strategies	7	0	11	43	46	4.33	.724
14.	Ask open ended questions.	8	0	21	42	28	3.87	.95
17	Encourage more practical activities in classrooms.	7	3	15	39	44	4.22	.832
18	Ask background knowledge related to the lesson	0	1	12	40	46	4.31	.740
19	Stimulate and value the interpretation by PT.	0	1	14	41	44	4.26	.755
21	Link teaching to real classroom situation in schools.	0	4	12	34	51	4.32	.816
	Average response	3	2	13	41	40	4.24	.464

Table 4.22 presents the self- reported constructivist practices of teacher educators. Data revealed that 81% teacher educators used constructivist instructional practices. It is concluded that majority of educators practiced constructivist practices in classrooms.

4.2 ANALYSIS OF CORRELATIONS AMONG VARIABLES

Correlation analysis was performed in order to find out correlation among the variables, epistemological beliefs, instructional beliefs and instructional practices. Low, medium and highest correlation was determined with the values provided by Gay, Mills and Airasian (2015).

Coefficient	Relation between Variables
Between +0.35 and -0.35	Weak or none
Between + 0.35 and 0.65 OR Between -.0.35 and -0.65	Moderate
Between +0.65 and 1.00 OR Between -1.0 and -0.65	Strong

Objective No: 4 Measure the Relationship *between* Epistemological Beliefs and Instructional Beliefs

Table 4.23

Relationship between Epistemological Beliefs and Instructional Beliefs

		Mean of EB	Mean of IB
Mean of Epistemological (EB)	Pearson Correlation Sig. (2-tailed)	1	.247** .003
	N		140
Mean of Instructional Beliefs (IB)	Pearson Correlation	.247** .003	1
	Sig. (2-tailed)		
	N	140	

** Correlation is significant at the 0.01 level (2-tailed).
Upper figure in the cell = Pearson Correlation Coefficient (r)
Lower figure in the cell = P-value

Table 4.23 shows interrelationship of EB with IB .There was weak positive correlation between epistemological beliefs and Instructional beliefs of teacher educators with r = .247**, p = .003

It means that when the epistemological the epistemological beliefs are getting more unsophisticated, the instructional beliefs are also increasing.

Objective No: 5 Measure the Relationship between Epistemological Beliefs and Classroom Practices

Table 4.24

Relationship of Epistemological beliefs with the Classroom Practices of Teacher Educators

		Mean of EB	Mean of IP
Mean of Epistemological Beliefs (EB)	Pearson Correlation Sig. (2-tailed) N	1	.236** .005 140
Mean of Instructional Practices (IP)	Pearson Correlation Sig. (2-tailed) N	.236** .005 140	1

**. Correlation is significant at the 0.01 level (2-tailed).

Upper figure in the Cell = Pearson Correlation Coefficient (r) Lower figure in the Cell = P-value

Table 4.24 shows interrelationship of EB with IP .There was weak positive correlation between epistemological beliefs and Instructional beliefs of teacher educators with r = .236**, p = .005. It means that when the epistemological beliefs are getting more unsophisticated, the instructional beliefs are also increasing.

Objective No: 6 Measure the Relationship between Instructional Beliefs and Classroom Practices

Table 4.25

Relationship between Instructional Beliefs and Instructional Practices

		Mean of IB	Mean of IP
Mean of Instructional Beliefs (IB)	Pearson Correlation Sig. (2-tailed) N	1 140	.452** .000 140
Mean of Instructional Practices (IP)	Pearson Correlation Sig. (2-tailed) N	.452** .000 140	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.25 shows the results of interrelationship between instructional beliefs and instructional practices of teacher educators. The results delineated that there was positive moderate correlation between IB and IP ($r = .452^{**}$, $p = .000$).

It means when instructional beliefs increased, the instructional practices would also increase.

Objective No: 07 Difference between Self-Reported and Observed Instructional Practices

Table 4.26

Observed Constructivist Practices

S#	Item	N%	R%	S%	O%	A%	M	SD
2	Provide many opportunities to PT to find answers to questions about a lesson.	0	3	41	56	0	3.52	.56
4	Facilitate PT to interact with each other in classroom for learning.	0	3	50	27	3	3.11	.76
10	TE encourages more discussion in classroom among PT on the learning objectives.	0	15	41	41	3	3.32	.76
7	Make instruction flexible to accommodate individual differences among PT	0	0	27	68	6	3.79	.53
15	TE asks Open ended questions to assess understanding.	0	15	53	29	3	3.20	.72
16	TE use different instructional strategies to meet the individual needs of learners	0	15	32	50	3	3.41	.78
18	TE encourage more practical activities in classrooms	3	21	35	38	3	3.17	.90
20	Teacher educator stimulates and value the interpretation of PT.	0	27	68	6	0	3.79	.53
13	Encourages construction of knowledge from learning experiences.	0	24	35	41	0	3.17	.79
22	Links teaching to real classroom in schools	0	9	35	47	9	3.55	.78
19	Ask background knowledge	0	0	56	44	0	3.55	.50
	Average	.27	12	43	41	3	3.42	.41

Note: 1= Never 2= Rarely3=Sometimes 4= often 5= always M: Mean

SD: Standard Deviation

Table 4.26 revealed that 44% teacher educators used and 43% sometimes used constructivist instructional practices. The mean value 3.42 showed that teacher educators sometimes used constructivist instructional practices. According to data collected from observation teacher educators sometime used constructivist practices.

Table 4.27

Observed Traditional Practices

S.NO	Item	N%	R%	S%	O%	A%	M	StD
1	The TE corrects misconceptions instead of asking learners to correct them.	0	0	59	41	0	3.41	.50
5	Ask the PT to remember what TE taught to PT.	0	3	59	38	0	3.35	.54
6	Ask PT to read only one material for learning.	0	6	9	53	3	3.14	.85
3	TE deliver lectures in the classroom most of the time.	0	3	44	47	6	3.55	.66
8	Give only tests for assessment in classroom.	0	21	48	29	3	3.14	.85
14	Provide students with accurate and complete knowledge rather than asking them to discover it on their own.	0	3	41	53	3	3.55	.61
17	Impart knowledge to learners.	0	9	41	41	39	3.50	.78
21	Give that knowledge which is proven by research.	0	3	35	47	9	3.44	56
12	Encourage memorization of information.	0	3	59	38	0	3.00	.69
11	Keep PT limited to the desk.	0	24	29	39	9	3.32	.76
9	Prescribe certain methods.	3	18	59	21	0	2.97	.71
	.Average response	.27	8	44	41	6	3.31	.42

Table 4.27 shows that as a whole out of total observed teacher educators 44% sometimes used traditional instructional practices. The mean value (3.31) also showed educators sometimes used traditional instructional practices in classrooms.

To conclude observed teacher educators sometimes used traditional instructional practices in teacher education classes.

Self-Reported Practices of Observed Teacher Educators

Table 4.28

Traditional Practices

S.NO	Item	N%	R%	S%	O%	A%	M	StD
1	The TE corrects misconceptions instead of asking learners to correct them.	9	18	38	8	4	3.11	1.12
5	Learning means remembering what the teacher educator has taught to PT.	3	6	21	18	53	4.11	1.12
6	Ask PT to read only one material for learning.	38	24	35	0	3	2.05	1.01
3	TE deliver lectures in the classroom most of the time.	0	15	47	27	9	3.35	.88
8	Give only tests for assessment.	12	38	21	27	3	2.70	1.08
13	Provide students with accurate and complete knowledge rather than asking them to discover it on their own.	9	18	38	27	9	3.08	1.08
16	Impart knowledge to learners	0	0	19	24	65	4.52	.70
20	Give that knowledge which is proven by research.	3	12	24	35	27	3.70	1.08
11	Keep PT limited to the desk	41	15	27	12	6	2.26	1.28
9	Prescribe certain methods.	15	21	36	18	19	2.91	1.21
	Average	13	17	31	20	20	3.18	.63

Table 4.28 shows that as a whole 40% used traditional instructional practices. Mean value of the self- reported traditional practices was 3.18 with Standard Deviation .63. This showed that teacher educators sometimes used traditional instructional practices.

Table 4.29

Self -Reported Constructivist Practices

S#	Item	N%	R%	S%	O%	A%	M	SD
2	Provide many opportunities to PT to find answers to questions about a lesson.	0	0	9	59	32	4.23	.60
4	Facilitate PT to interact with each other in classroom for learning.	0	6	12	18	53	4.11	.84
10	TE encourages more discussion in classroom among PT on the learning objectives.	0	0	15	30	56	4.41	.74
7	Make instruction flexible to accommodate individual differences among PT.	0	3	9	47	41	4.26	1.28
14	TE asks open ended questions to assess understanding.	0	3	32	41	24	3.85	.82
15	TE use different instructional strategies to meet the individual needs of learners.	0	0	31	47	50	4.47	.56
17	TE encourages more practical activities in classrooms.	0	0	15	44	41	4.26	.70
19	Teacher educator stimulates and value the interpretation of PT.	0	0	9	53	35	4.20	.72
12	Encourages construction of knowledge from learning experiences.	0	0	12	50	38	4.26	.66
21	Links teaching to real classroom in schools.	0	3	12	27	58	4.41	.82
18	Ask background knowledge.	0	0	12	44	44	4.32	.68
	Average response	0	2	17	46	47	4.25	.41

Table 4.29 shows self-reported constructivist instructional practices of the observed teacher educators. It showed that 93% teacher educators practiced constructivist instructional practices in teacher education classrooms. The mean value (4.25) as per mean score criteria showed that educators often used constructivist instructional practices.

Table 4.30

Difference between Observed and Self-Reported Traditional Practices

Variables	Mean	Std	M.D	t value	Sig
Observed Traditional Practices	3.31	.42	0.13	1.049	.302
Self-Reported Traditional Practices	3.18	.63			

Mean Difference is not Significant at P<0.05

Table 4.30 shows the comparison of observed traditional instructional practices and self-reported traditional instructional practices. The mean value of observed traditional instructional practices was 3.31 with S.D .42 and the mean value of self-reported instructional practices was 3.18 with S.D. 3.18. But paired t test showed no significant difference as p> 0.05.

There was difference in the self -reported and observed instructional practices of teacher educators but the difference was not significant.

Table 4.31

Difference in the Observed and Self-Reported Constructivist Instructional Practices

Variables	Mean	Std	M.D	t value	Sig
Observed Traditional Practices	3.4251	.48556	.83	7.832	.000
Self-Reported Traditional Practices	4.2567	.41174			

Mean Difference is Significant at P<0.05
N= Number of observed teachers, S.D= Standard Deviation

Table 4.31 shows that the mean value of observed constructivist practices was 3.42, S.D .48 and the mean value of self- reported constructivist practices was 4.25, S.D .41. Mean difference between the observed constructivist instructional practices and self - reported constructivist practices is significant as $p < 0.05$.

In the self-reported instructional practices teacher showed themselves as more constructivists but observation showed that there was significant difference in their reported and observed instructional practices.

4.3 SUMMARY OF THE CHAPTER

This chapter presented data analysis. First of all the demographic variables were presented in tables. Then, epistemological beliefs of teacher educators were given in percentages and mean values. After analyzing epistemological beliefs by finding percentages, means and Standard Deviations of the beliefs which were meant to answer objective No: 1. Then, instructional beliefs were analyzed which covered objective No: 2 of the study. It was followed by instructional practices of teacher educators, related to objective No: 3. it was followed by correlation among all the variables. At the end data collected from classroom observation of teacher educators was analyzed and it was compared with their self -reported instructional practices of teacher educators.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents findings of the research work. First, findings about epistemological beliefs are presented. Second, findings about instructional beliefs are given. Third, findings about instructional practices of teacher educators are offered. The chapter also contains findings from correlation. In discussion part, findings of the current research are discussed in connection with other such studies. The chapter also contains conclusions and recommendations for further research in the area.

5.2 SUMMARY

Beliefs about knowledge and beliefs about instruction effect classroom practices of teachers. Beliefs of teachers about other subjects and beliefs of prospective teachers had been investigated but the researcher did not find studies on the general epistemological beliefs of teacher educators in the context of innovated curricula. Teacher education curriculum was innovated and implemented in teacher education institutions in Pakistan. Research has reported that beliefs about teaching and learning are formed by the type of experiences people are exposed to during learning. No one had looked into the epistemological beliefs of teacher educators whether they conformed to the recommended practices in the curriculum. This study looked into the beliefs of teacher educators about knowledge and instruction and investigated their

relationship with the classroom practices of teacher educators in Khyber Pakhtunkhwa Pakistan.

The current study investigated the beliefs of teacher educators in 20 Regional Institutes of teacher education and (09) universities. All these institutions provide pre-service education to prospective teachers. Prospective teachers, after getting degrees from these institutions, go through the process of recruitment and they are appointed as teachers in primary and secondary schools in the country. This current research measured the general epistemological beliefs, instructional beliefs of teacher educators, instructional practices of teacher educators and determined the relationship of epistemological beliefs and instructional beliefs of teacher educators with their instructional practices of teacher educators.

This present study investigated the general epistemological beliefs of teacher educator through a 56 items questionnaire which was adopted for the study. The instructional beliefs and instructional practices of teacher educators were examined through self-developed questionnaires. Data were analyzed by finding the percent and means score of educators holding particular beliefs; relationship was examined by calculating Pearson r and paired t–test was used for calculating difference between the observed and self- reported instructional practices of teacher educators.

The chapter presents findings, conclusions related to the objectives; implications of the study for teacher training, teacher education, curriculum implementation; and identified areas for future research.

5.3 FINDINGS

Findings from the descriptive statistics addressed objective 1, 2 and 3 of the study. The findings about these three objectives are given below.

5.3.1 The Epistemological Beliefs of Teacher Educators

The first objective of the study was to measure the epistemological beliefs of teacher educators in teacher education institutions. There are five dimensions of epistemological beliefs. The descriptive statistics show which level (sophisticated or unsophisticated) of beliefs the teacher educators had about the dimensions of epistemological beliefs.

5.3.1.1 Structure of Knowledge

Table 4.7, 4.8 presented beliefs of teacher educators about structure of knowledge and 59% teacher educators believed that knowledge was simple and absolute. Mean value: 3:00 of their beliefs also showed that teacher educators believed that structure of knowledge was simple.

5.3.1.2 Certainty of Knowledge

Table 4.9-10 showed educators' beliefs about certainty of knowledge. Majority (44%) disagreed that knowledge was certain. The mean value (2.95) of educators' beliefs about certainty of knowledge revealed teacher educators had low level sophisticated beliefs.

5.3.1.3 Source of Knowledge

Table 4.12 presented the beliefs of educators about source of knowledge. Majority (46%) teacher disagreed that source of knowledge was not authority. The mean value, 2.89, educators' showed that educators had low sophisticated beliefs about the dimension.

5.3.1.4 Ability to Learn

Table 4.15 revealed that 61% teacher educators believed that ability to learn was not innate, it could be acquired. The accumulative mean value (2.56) about ability of learning showed that teacher educators had low sophisticated epistemological beliefs.

5.3.1.5 Speed of Learning

Table 4.18 reflected that 67% teacher educators believed that learning was not a quick process, it is taking place slowly. The mean value (2.39) delineated that teacher educators had low sophisticated beliefs about this dimension of knowledge.

5.3.2 Instructional Beliefs of Teacher Educators

The 2nd objective was to find out the instructional beliefs of teacher educators. Beliefs about instruction were mainly divided into two categories: constructivist beliefs, traditional beliefs. Table 4.19 showed that 90% educators believed in constructivist instructional practices. Mean value (4.17) also showed that majority of the teacher educators believed in constructivist beliefs.

5.3.3 Instructional Practices of Teacher Educators

The 3rd objective of the study was to find out the instructional practices of teacher educators in teacher education institutions. The instructional practices are mainly divided into 2 categories: traditional instructional practices and constructivist instructional practices. Table 4.22 presented the self- reported constructivist practices of teacher educators. Data revealed that 81% teacher educators used constructivist instructional practices.

5.3.4 Relationship between epistemological beliefs and instructional beliefs of teacher educators

$H_0$1 There is no significant relationship between epistemological beliefs and instructional beliefs of teacher educators.

The fourth objective of the study was to measure the relationship between epistemological beliefs and instructional beliefs of teacher educators. Table 4.23 reflected that there was positive weak correlation of epistemological beliefs with the instructional beliefs of teacher educators (r = 247**, p = 000). So null hypothesis stood rejected.

5.3.5 Relationship between Epistemological Beliefs and instructional Practices of Teacher Educators

$H_0$2 There is no significant relationship between Epistemological Beliefs and Instructional beliefs.

Objective number 5 of the study was to measure the relationship between epistemological beliefs and instructional practices of teacher educators. The Table 4.24 showed interrelationship of EB with IP .There was weak positive correlation between epistemological beliefs and Instructional beliefs of teacher educators with r = .236**, p = .005. It means that when the epistemological beliefs are getting more unsophisticated, the instructional beliefs are also increasing.

5.3.6 Relationship between Instructional Beliefs and Instructional Practices of Teacher Educators.

$H_0$3. There is no significant relationship between instructional beliefs and instructional practices of teacher educators.

Objective number 6 of the study was to measure the relationship between instructional beliefs and instructional practices. The table 4.25 showed the results of interrelationship between instructional beliefs and instructional practices of teacher

educators. The results delineated that there was positive moderate correlation between IB and IP ($r = .452^{**}$, $p = .000$).

5.3.7 FINDINGS FROM CLASSROOM OBSERVATIONS

5.3.7.1 Difference in the Traditional Practices

Objective number7 of the current study was to find the difference between the observed and self-reported instructional practices of teacher educators. The comparison of observed traditional instructional practices and self-reported traditional instructional practices showed that there was difference in the mean values of self and observed traditional instructional practices as the mean value of observed traditional instructional practices was 3.31 with SD .42 and the mean value of self- reported instructional practices was 3.18 with S.D. 3.18. But paired t - test showed no significant difference as $p > 0.05$. (Table 4.30).

5.3.7.2 Difference in the Observed and Self-Reported Constructivist Instructional Practices

The mean value of observed constructivist practices was 3.42, SD.48 and the mean value of self- reported constructivist practices was 4.25, S.D .41. Mean difference between the observed constructivist instructional practices and self-reported constructivist practices was significant as $p < 0.05$. (Table 4.31).

5.4 DISCUSSIONS

As discussed earlier that beliefs about knowledge and beliefs about instruction effect classroom practices of teachers. This study looked into the beliefs of teacher educators about knowledge and instruction and found their relationship with the classroom practices of teacher educators in Khyber Pakhtunkhwa Pakistan.

The current study measured the epistemological beliefs, instructional beliefs of, investigated the instructional practices, determined the relationship between epistemological beliefs, examined instructional beliefs of teacher educators, measured the relationship of beliefs with the classroom practices and measured difference in the observed and self- reported instructional practices of teacher educators in teacher education institutions.

Teacher educators' general epistemological beliefs had not been investigated in research. Therefore, findings could be discussed with beliefs of other teachers. The current study investigated the beliefs of teacher educators from the perspective of Shommer (1990) model. There are five dimensions of the models. Dimnesion1 investigates the structure of knowledge. It means whether the educators viewed knowledge as simple or complex. The study found that the teacher educators did not believe in the complexity of knowledge. They believed in single answer. So according to the scale the teacher educators did not have sophisticated beliefs about the structure of knowledge.

Second, the study found that teacher educators as a whole believed in integrating ideas for understanding but there was some confusion in their beliefs as findings of items 34 and 31 showed that educators believed in details and remembering the details but in response to the item "in getting the big idea from reading", they believed in getting the big idea. It showed that educators were somewhat confused in their beliefs about knowledge in this sub dimension.

Teacher educators did not believe in the 'Certainty of knowledge' and their beliefs were low level sophisticated but still there were many teacher educators whose response to some of the items showed that they believed in the certainty of knowledge, for instance, mean value, 3.85 (53%) of the statement, "Scientist can finally get to the

truth' showed that the beliefs of teacher educators are unsophisticated". As a whole the study contradicted the findings of Alsumait (2015) who found that the participants believed in the certainty of knowledge.

This study was seeking if the educators deemed the source of knowledge, authority or reasoning. This study found that educators believed in authority as a source of knowledge. This showed the effect of culture on the beliefs of teachers in Pakistan. Here people give more respect to elders, teachers and those who are known scholars in a field. There is little critical thinking and questioning. Teacher educators' believed in criticizing authority. But again there was somewhat confusion in their beliefs because majority of them believed that "Those who challenge experts are over confident". Majority of the teacher educators believed that ability to learn was innate which was considered as unsophisticated belief according to the scale. Teachers in Pakistan generally believe that some people are born intelligent and they can excel in studies but they also believe in hard work as well. For instance, the response to the statement 1, "Genius is 10% ability and 90% hard work", was mixed response, about half of them believed in hard work and half in innate capacity. This finding extended the findings of Alsumait (2015) who found the participants of the study believed in hard work as well in inborn ability of learning.

Most of the teacher educators had sophisticated beliefs about the sub dimension of learning. Learners can improve their learning by learning the skills. Majority of the teacher educators believed that learning could take place when learners keep on working. But some of the beliefs were unsophisticated, like, "Successful students can understand things quickly", "If I am ever going to be able to understand something, it will make sense to me the first time I hear it" Majority of the teacher educators believed

that learning was a slow process and they agreed that intense effort was not a waste of time.

Majority of the teacher educators believed in constructivist instructional beliefs according to the scale and teacher educators had low traditional instructional beliefs. The response of majority of teachers to some statements, like, "Teacher educator is to impart knowledge", showed that educators imparted knowledge. They did not allow the learners to create knowledge. Similarly, educators prescribed certain methods and they corrected misconceptions instead of asking the learners. All these responses showed that teacher educator might not have clear understanding about constructivist beliefs.

Teacher educators used low traditional instructional practices. It means that there is a scope for improvement. The self- reported constructivist instructional practices showed that most of the teacher educators practiced constructivist practices in classroom. The confusion, mentioned earlier, still existed in the instructional practices of teacher educators.

There was moderate positive correlation between epistemological beliefs and traditional beliefs of teacher educators. It means that when the value of epistemological beliefs increased (teacher educators have unsophisticated beliefs) traditional instructional beliefs would increase and when the value of epistemological beliefs decreased the teacher educators would have more sophisticated beliefs. So, the traditional beliefs would also decrease. As a whole, there was positive but low correlation of epistemological beliefs with the instructional beliefs of teacher educators. These findings are in line with the findings of Chan (2004) who found positive correlation beween the epistemological and teaching and learning conception of teacher educationstudents in Hong Kong. Similarly, the study also supported the findings of

Chan (2002) who found that epistemological beliefs had significant effect on the instructinal strategies.

There was moderate positive correlation between the values of epistemological beliefs and traditional practices of teacher educators. It means that when the value of epistemological beliefs increases, traditional instructional practices would increase. As a whole, there was positive but low correlation of epistemological beliefs with the instructional practices of teacher educators. It means that when the beliefs become unsophisticated the instructional practices will become more traditional and when the epistemological beliefs become more sophisticated, practices will become more constructivists. Moreover, the study supported the findings of Kang and Wallace (2005) who found that teachers' naïve epistemological beliefs were visible in their classroom practices but the sophisticated beliefs were not always connected to the practices.

The results delineated that there was positive significant correlation between traditional practices and traditional beliefs but there was negative co-relationship between constructivist instructional beliefs and traditional instructional beliefs and traditional classroom practices respectively. Further, there was also negative correlation between constructivist practices and traditional beliefs and traditional practices.

This research found significant positive correlation between constructivist practices and constructivist beliefs. This supported the findings of Tillema's (2000) findings which provided evidence that teaching was a complete cognitive activity and teachers' beliefs strongly affected teachers' practices. Furthermore, instructional beliefs as a whole had significant positive correlation with traditional classroom practices. Instructional practices, as a whole, had significant positive correlation with traditional beliefs. Moreover, there was insignificant positive correlation with constructivist beliefs.

The comparison of observed traditional instructional practices and self-reported traditional instructional practices showed that there was difference in the mean values of self and observed traditional instructional practices but the difference was not significant. The educators, in their self- reported traditional practices, had shown themselves just low traditional regarding instructional practices.

There was significant difference in the observed and self-reported constructivist practices of teacher educators. In the self- reported constructivist practices, they had shown themselves more constructivists while in the observation they were less constructivists. The findings of the study corroborated the findings of Kalsoom (2013); Chew (2012); Akbar, Akhtar, Hussain and Abiodullah (2013). The results showed inconsistencies between teachers' beliefs and actual classroom practices.

5.5. CONCLUSIONS

1. Majority of the teacher educators believed that knowledge was simple and absolute rather than complex. They did not have sophisticated beliefs about the structure of knowledge. Their epistemological beliefs were low level unsophisticated beliefs about the structure of knowledge. It means that educators do not have the required beliefs and they need to study further and bring necessary changes in their beliefs (Finding 5.3.1.1).
2. Majority of teacher educators disagreed that knowledge was certain. The mean value of educators' beliefs about certainty of knowledge revealed that teacher educators had low level sophisticated beliefs. It means that their beliefs were sophisticated but they needed further sophistication in their beliefs. (Finding 5.3.1.2).

3. Majority of teachers disagreed that source of knowledge was authority. They believed in reasoning and acquisition of knowledge. But their beliefs were also low sophisticated beliefs about the dimension. They needed further deliberation on their beliefs (Finding 5.3.1.3)

4. Majority of teacher educators believed that ability to learn was not innate, it could be acquired. Again, there is need for improvement because when teachers believe that the capacity to learn is innate. Then, teachers do not encourage all learners. Thus, some of the students are discouraged from striving to learn. (Finding 5.3.1.4).
5. It was concluded that majority of the teacher educators believed that learning was not a quick process, it is taking place slowly. The mean value delineated that teacher educators had low sophisticated beliefs about this dimension of knowledge (Finding 5.3.1.5).
6. It was concluded that most of the educators believed in constructivist instructional practices and it was concluded from the self- reported classroom practices that they practiced constructivist instructional practices (Finding 5.3.2, 5.3.3).
7. There was positive weak correlation of epistemological beliefs with the instructional beliefs of teacher educators. So null hypothesis stood rejected. There was weak positive correlation between epistemological beliefs and instructional beliefs of teacher educators which means that when the epistemological beliefs are getting more unsophisticated, the instructional beliefs are also increasing, becoming more traditional and in case of sophisticated epistemological beliefs when the value of epistemological beliefs decreases, the constructivist beliefs would also increase (Finding 5.3.4).

8. There was weak positive correlation between epistemological beliefs and Instructional beliefs of teacher educators. It means that when the epistemological beliefs are getting more unsophisticated, the instructional beliefs are also increasing (Finding 5.3.5).
9. The results delineated that there was positive moderate correlation between instructional beliefs and instructional practices. It means when instructional beliefs becomes traditional, instructional practices would also become traditional and if the instructional beliefs become constructivist, the instructional practices would also become more constructivist (Finding 5.6.3).
10. Based on the data from observation of classrooms it was concluded that educators sometime used constructivist practices and sometime used traditional instructional practices. The comparison of observed traditional instructional practices and self-reported traditional instructional practices showed that there was difference but the difference was not significant but in case of constructivist practices there was significant difference between the self-reported constructivist instructional practices and observed constructivist instructional practices (Findings 5.7.1, 5.7.2).

The difference in the observed and self- reported constructivist instructional practices may be due the lack of skills in the implementation of constructivist beliefs. Most of the teachers have studied in the traditional schools and the teaching in the departments of education at universities is also done in the traditional ways. Teacher educators do not have enough chances for updating their teaching methodology. Moreover, they feel easy in their traditional approaches. Furthermore, the application of constructivist approaches in classrooms require more preparation from teacher

educators. It was found during observation that teachers were not well prepared for their classes.

5.6 RECOMMENDATIONS

On the basis of findings, conclusions and discussion of the study, the following recommendations are made:

1. The conclusions of the study revealed that teacher educators had un-sophisticated beliefs about the dimension "Structure of Knowledge" and as a whole they had low sophisticated beliefs. They should have sophisticated beliefs because they are highly qualified, trained and experienced teachers and above all they are teacher educators. These unsophisticated beliefs, as research shows, have bearing on the instructional practices of teachers. Therefore, the study recommends orientation for teacher educators in epistemological beliefs and instructional beliefs. This can be done through training on the epistemological beliefs system. Trainings can be arranged by the universities themselves or they can ask for funding from the Higher Education Commission of Pakistan. The teacher educators could benefit from online resources available, group discussion and in house professional development program.
2. Based on the conclusions there was positive correlation between the beliefs and practices of teacher educators. When a change is not according to the beliefs of teachers, they do not implement the change or they change the reform according to their beliefs. Teachers are the implementers, without them change in not possible. So, the study also recommends consideration for the beliefs of teachers when developing a new curriculum or any change in the education system. This is possible through meetings with the representatives of teachers. They can tell

the ground realities in schools. The government or NGOs may arrange conferences and seminars on the impending changes in the system.

3. The conclusions reflected that teacher educators themselves need improvement in the implementation of constructivist practices. They had problems in the implementation of these practices. Therefore, the study recommends professional development program on the constructivist instructional practices in teacher education institutions. This can be done by taking help from the Learning Innovation Division, HEC of Pakistan. Training may be organized on the constructivist instructional practices in universities wherein all the faculties may be given chance for the improvement of instructional practices especially, constructivist practices which are recommended for instruction.
4. Teacher education curriculum may give special emphasis upon constructivist instructional practices practically. Prospective teachers may be given a lot of opportunities under the guidance of expert teachers for the implementation of constructivist practices.
5. Epistemological and instructional beliefs need to be the part of the curriculum in greater detail. In the new curriculum, there is not any detailed discussion or activities on the belief system of learners and teachers. There may be courses in teacher education curriculum on the beliefs and constructivist instructional practices so that the students are well grounded in theory and practice of constructivist beliefs and practices. The content in appendix F is recommended for a subject on beliefs for B.Ed. honor, Associate Degree in Education (ADE) and B.Ed. 1.5 years.

5.7 IMPLICATIONS OF THE RECOMMENDATIONS

1. The above mentioned recommendations of the study may have far-reaching effects on the teaching and learning in teacher education classrooms and classrooms in other intuitions. The implementation of these recommendations would have positive effect on the beliefs of teachers. Their beliefs would change into more sophisticated beliefs. Consequently, the change in beliefs would bring necessary change in their practices. They would become more constructivists in their instructional practices. When teacher educators are given training or they themselves arrange for their professional development; their instructional practices would become more constructivist. They would teach prospective teachers in line with the recommended practices for the teacher education curriculum in Pakistan.
2. Moreover, when these prospective teachers join schools as teachers, they would practice constructivist practices in school and thus meaningful teaching and learning would be encouraged.
3. Furthermore, the suggested content and practices may enable the prospective teachers to have a clear understanding of the beliefs, constructivism and instructional practices. Consequently, it would make the implementation of constructivist practices easy in classroom.

5.8 RECOMMENDATIONS FOR FUTURE RESEARCH

The study is important for teacher education, curriculum implementation, teacher training, and curriculum development and for the successful implementation of any program. Therefore, the study suggests further research in many areas related to the topic.

1. The curriculum for teacher education is being implemented all over the country. The current study was conducted in one unit of Pakistan. The study may be replicated in other units of Pakistan.
2. A more in depth study may be conducted by collecting data from larger sample added by qualitative data from a few teacher educators.
3. The study found discrepancy between the observed constructivist practices and self- reported constructivist practices. A study may be conducted to investigate the causes of difference in the self-reported and observed constructivist practices.
4. Moreover, the study found that the teacher educators did not have clear perceptions of the constructivist practices and beliefs. There is need of conducting research to investigate the level of knowledge about constructivist beliefs and practices.
5. Furthermore, the study investigated the beliefs of teacher educators from self-reported perspectives and observation. In future, the researchers may analyze teachers' file, students' subject files and interview the educators.

5.9 LIMITATIONS IN DATA COLLECTION

1. Some of the participants did not show that much responsible behavior in filling the questionnaire. They did not give the time which was required for filling the questionnaire.
2. Teachers were hardly ready for observing their classes by the researcher. The culture of classroom observation is rare in Pakistan.

3. The teacher did not teach in their normal style, therefore, it would become difficult to get the true picture in a few classes. However, the researcher used all possible means to get authentic data as far as possible.
4. Classroom observation was carried out only for an hour in classrooms. If the researcher has conducted observation for longer time, the researcher will have done more in depth observation of the classroom instructional practices.

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APPENDIX A

REPORT OF THE NATIONAL TASK FORCE ON TEACHER EDUCATION

A National Task Force, consisted members from all provinces of Pakistan, was establishment under the directions of the Pre-STEP National Steering Committee in April 2009. After a lot of consultation, the committees reached to the following findings about the prevailing teacher education in Pakistan.

1. Pre-service teacher education programs do not have quality course content to conform to the National Professional Standards.
2. These teacher education courses cannot prepare teachers who can implement the 2006 National Scheme of Studies for K-12 grades.
3. The available courses have short duration, more theoretical courses, ineffective practice teaching; ineffective formative, summative assessment and low entry academic requirements.
4. Teacher educators do not have the required academic and professional qualifications.
5. The current primary school teacher certification programs do not have breadth of general liberal education nor depth of subject matter proficiency.
6. The pedagogy of the current teacher education courses does not have interactive and students' centered learning strategies.
7. Professional capacity of the faculty at the teacher education institutions does not meet the requirement of arduous teacher education program.
8. Faculty in the teacher education institutions is not appointed on the basis of merit; they are placed on the basis of seniority.

9. Salary and service conditions do not attract academically sound candidates.

Recommendations of the Provincial Advisory Committees

1. The committee recommended four-year degree program in education which is an amalgamation of theory and practice for producing reflective teachers.
2. The course shall include a set of general education, core courses, foundation courses in education and pedagogy, content courses to develop subject-matter proficiency in at least two disciplines of knowledge and a sequence of supervised, school-based internships and teaching practice.
3. Four-year degree shall be required for all teachers after 2018.
4. During 2010-2018, a two-year Associate Degree in Education (ADE) will be offered with a mix of general education, subject matter preparation and pedagogy.
5. In-service teachers should be encouraged and facilitated for getting 4-year degree in education.
6. Teacher educators' cadre will be created for teaching in RITEs and Education Colleges (Higher Education Commission, 2010).

APPENDIX B

RESEARCH TOOLS

Part A

Demographic Information

1. Institution
   □ RITE □ University
2. Sex
   □ Male □ Female
3. Age group
   □ 24-30 □ 31-40 □ 41-50 □ above 50
4. Academic qualification
   □ MSc □ MA □ M. Phil □ Ph. D
5. Professional qualification
   □ B. Ed □ M. Ed □ MPhil in Education □ PhD in Education
6. Teaching Experience
   □ Less than a year □ 1-5 years □ 6-10 years □ More than 10 years

PART B

Instructional Beliefs Questionnaire (IBQ)

This part of the questionnaire explores your instructional beliefs. Please encircle the option which shows your instructional beliefs.

SD: Strongly Disagree D: Disagree NS: Not Sure A: Agree
SA: Strongly Agree

	Statements	SD	D	NS	A	SA
1	A teacher educator's task is to correct learning misconceptions (errors) immediately instead of asking learners to correct them.					
2	Learning occurs when prospective teachers have many opportunities to find answers to questions about a lesson themselves.					
3	Effective teaching occurs when teacher educator delivers lectures in the classroom most of the time.					
4	A teacher educator should facilitate prospective teachers to interact with each other in classroom for learning.					
5	Learning means remembering what the teacher educator has taught to prospective teachers.					
6	It is important to ask prospective teachers to read only one material for learning.					

7	Instruction should be flexible to accommodate individual differences among prospective teachers.					
8	Only tests are enough for assessment in classroom.					
9	Teacher educators should prescribe certain methods of teaching which must be applied in every situation in classrooms.					
10	Effective teacher educators encourage more discussion in classroom among prospective teachers on the learning objectives.					
11	It is important to keep prospective teachers limited to the desks during instruction.					
12	Learning occurs when prospective teachers have many opportunities to discuss lessons with each other.					
13	Construction of knowledge from learning experiences should be encouraged instead of knowledge transmission.					
14	Teaching means to provide students with accurate and complete knowledge rather than asking them to discover it on their own.					
15	Open ended questions should be asked to assess understanding.					
16	Teacher educators should use different instructional strategies to meet the individual needs of learners.					
17	The major role of a teacher educator is to impart knowledge to prospective teachers.					
18	Effective teacher educators encourage more practical activities in classrooms.					
19	Effective learners learn without using their background knowledge.					
20	Teacher educator should stimulate and value the interpretation of prospective teachers.					
21	Only that knowledge should be given to prospective teachers which is proven by research.					
22	Teacher educator needs to link teaching to real classroom situation in schools.					

Part C

Questionnaire for Instructional Practices of Teacher Educators

Instructions:

This part of the questionnaire explores your actual classroom practices. Please encircle the option which shows your instructional practices when you teach to prospective teachers in classroom.

I, as a teacher educator------		Never	Rarely	Sometimes	Often	Always
1	Correct learning misconceptions (errors) immediately instead of asking learners to correct them.					
2	Provide many opportunities to prospective teachers to find answers to questions about a lesson themselves.					
3	Deliver lecture in the classroom most of the time.					
4	Facilitate prospective teachers to interact with each other in classroom for learning.					
5	Encourage prospective teachers to remember what I have taught them.					
6	Encourage prospective teachers to read only one material for learning.					
7	Make instruction flexible enough to accommodate individual differences among prospective teachers.					
8	Give only tests for assessment in classroom.					
9	Prescribe certain methods of teaching which must be applied in every situation in classrooms.					
10	Encourage more discussion in classroom among prospective teachers on the learning objectives.					
11	Keep prospective teachers limited to their desks during instruction.					
12	Encourage construction of knowledge from learning experiences instead of knowledge transmission.					
13	Provide students with accurate and complete knowledge rather than asking them to discover on their own.					
14	Ask open ended questions to assess understanding.					
15	Use different instructional strategies to meet the individual needs of learners					
16	Impart knowledge and skills to prospective teachers.					
17	Encourage more practical activities in classrooms.					
18	Ask background knowledge in classroom related to the lesson.					

19	Stimulate and value the interpretation of prospective teachers.					
20	Give only research based knowledge to prospective teachers					
21	Link teaching to real classroom situation in schools.					

PART D

PERSONAL EPISTEMOLOGICAL QUESTIONNAIRE

Personal epistemology means personal conception of knowledge and knowing.

S#	Statements	SD	D	N S	A	SA
1	If I am ever going to be able to understand something, it will make sense to me the first time I hear it اگر کوئی چیز آپ کی سمجھ میں آتی ہے تو پہلی دفعہ سننے سے ہی سمجھ میں آتی ہے					
2	The only thing that is certain is uncertainty itself. اگر کوئی چیز یقینی ہے تو وہ صرف غیر یقینی کیفیت ہے۔					
3	For success in school, it's best not to ask too many questions. سکول میں کامیابی کےلیے اچھی بات یہ ہے کہ بہت ذیادہ سوالات نہ پوچھے جائے۔					
4	A course in study skills would probably be valuable for learning. سیکھنے کے لیے ' پڑھای کے ہنر " سکھانے والا کورس اہم ہوگا ۔					
5	How much a student learns in a school depends mostly on the quality of teachers in that school. ایک طالبعلم جتنا سیکھتاہے اس کا انحصار ذیادہ تر اس سکول میں پڑھانے والے اساتذہ پر ہوتا ہے۔					
6	I can believe almost everything I read. وہ تمام چیزیں جو آپ پڑ ھتے ہیں ان پر یقین کر سکتے ہیں۔					
7	I was often curious to know how much my teachers really knew. میں اکثر تجسس میں تھا کہ میرے اساتذہ کتنا جانتے تھے۔					
8	The ability to learn is innate. سیکھنے کی صلاحیت پیدائشی ہوتی ہے۔					
9	Successful students in classroom understand things quickly. کمرہ جماعت میں کامیاب طلباء چیزوں کو جلدی سیکھتے ہیں۔					
10	If one tries hard enough, one can find the truth almost completely. اگر کوئی ذیادہ کوشش کرے تو حقیقت کو تقریبا مکمل معلوم کر سکتا ہے۔					
11	People who challenge experts are over-confident. وہ لوگ جو ماہرین کو چیلنج کرتے ہیں حد سے ذیادہ پُر اعتماد ہوتے ہیں ۔					
12	I try my best to connect information from different chapters of book. میں سمجھنے کے لیے کتاب کے مختلف ابواب سے معلومات مربوط کرتا ہوں					
13	The most successful learners have discovered how to improve their ability to learn.					

	کامیاب ترین سیکھنے والوں نے سیکھنے کی صلاحیت بڑھانے کا گُرُ معلوم کیا ہے					
14	The most important aspect of scientific work is precise measurement and careful work. سائنس کا اہم ترین پہلو صحیح پیمائش اور احتیاط سے کام کرنا ہے۔					
15	To me studying means getting the big ideas from the text, rather than details. میرے نذدیک کتاب سے مرکزی خیال لینا ہے ، نہ کہ معمولی معمولی تفصیلات ۔					
16	By the time one becomes a teacher educator, one should know what the best teaching method is. جب کوئی ٹیچر ایجوکیٹر بنتا ہے تو اسے سب سے بہتر طریقہ تدریس کا پتہ ہونا چاہیے۔					
17	Reading a difficult book chapter again and again usually will not help you understand it- ایک مشکل کتاب کو بار بار پڑھنا عموما سمجھنے میں مدد نہیں دیتا۔					
18	Scientists can finally get to the truth. ۔ سائنسدان آخرکار حقیقت کو پا لیتے ہیں					
19	You never know what a book means unless you know the purpose of the author. آپ کبھی بھی ایک کتاب کو نہیں سمجھ سکتے جب تک آپ کو کتاب لکھنے والے کا مقصد معلوم نہ ہو۔					
20	The most important part of scientific work is original thinking. سائنسی کام کا اہم ترین حصہ تخلیقی /حقیقی سوچ ہے۔					
21	If I find the time to re-read a textbook chapter, I get a lot more out of it the second time. اگر مجھے کتاب کو دوبارہ پڑھنے کا موقع ملے تو میں اس سے بہت کچھ سیکھتا ہوں۔					
22	Students have a lot of control over how much they can learn from a textbook. یہ طلباء پر منحصر ہے کہ وہ ایک کتاب سے کتناسیکھ سکتے ہیں۔					
23	Genius is 10% ability and 90% hard work. قابلیت دس فیصد پیدائشی اور نوے فیصد محنت پر مبنی ہے۔					
24	I feel very good when I think about issues that experts cannot agree on.- میں بہت اچھا محسوس کرتاہوں جب میں ان موضوعات پر سوچتا ہوں جن پر ماہرین متفق نہیں ہو سکتے۔					
25	Everyone needs to learn how to learn. ہر ایک کو یہ سیکھنا چاہیئے کہ کسطرح سیکھا جاتا ہے					
26	If there is a difficult concept in a textbook, it is better to solve yourself. جب نصابی کتب میں کو ئی مشکل پیش آئے تو چاہیئے کہ اسے خود حل کیا جائے۔					
27	A sentence has little meaning unless you know the situation in which it is spoken.					

	ایک جملے کا مفہوم تب تک سمجھ نہیں آتا جب تک اسکے سیاق وسباق معلو م نہ ہو۔					
28	Being a good student generally involves memorizing facts. ایک اچھا طلب علم حقائق زبانی یاد کرتا ہے۔					
29	Wisdom is not knowing the answers, but knowing how to find the answers. اصل عقلمندی جوابات جاننانہیں بلکہ جوابات " جاننے کا طریقہ " معلوم کرنا ہے۔					
30	Most words have one clear meaning. اکثر الفاظ کا ایک ہی واضح مفہوم ہوتا ہے۔					
31	I think a person is intelligent who forgets details but gives a new idea when reads a text. میرے خیال میں وہ شخص ذہین ہے جو کتاب پڑھنے کے بعد تفصیلات بھول کر ایک نیا سوچ /تصور دیتا ہے۔					
32	I consult experts when I face problem in life. زندگی میں جب بھی کوئی مسئلہ آتا ہے تو ماہرین سے رجوع کرتا ہوں۔					
33	Learning definitions word-for-word is often necessary to do well on tests. امتحان میں کامیابی کیلئے تعریفات کو لفظ بہ لفظ سیکھنا ضروری ہوتا ہے					
34	When I study, I look for the specific facts. میں دوران مطالعہ خاص حقائق کی تلاش کرتا ہوں۔					
35	If learners can't understand something within a short amount of time, they should keep on trying. اگر طالبعلم کسی چیز کو مقررہ وقت میں نہیں سمجھتا تو اس کو اپنی کوشش جاری رکھنی چاہیئے ۔					
36	Sometimes you just have to accept answers from experts even though you don't understand them. بعض اوقات ماہرین کے جوابات تسلیم کرنے پڑھتے ہیں اگر چہ آپ ان کو نہیں سمجھتے ۔					
37	I don't like stories that don't have an ending. میں ان کہانیوں کو پسند نہیں کرتا جنکا کوئی اختتام نہیں ہو۔					
38	Getting ahead in studies takes a lot of hard work. پڑھائی میں کامیابی کیلئے زیادہ کام درکار ہوتا ہے۔					
39	It's a waste of time to work on problems which have no possibility of coming out with a clear-cut answer. ایسے مسائل پر کام کرنا وقت کا ضیاع ہے جس کے واضح جواب کا امکان کم ہو۔					
40	You should evaluate the accuracy of information in a book, if you are familiar with the topic. کتاب میں دی گئی معلومات کے صحیح یا غلط ہونے کی جانچ پڑتال کرنی چاہیئے اگرچہ آپ پہلے سے ان سے واقف ہو۔					
41	Often, even advice from experts should be questioned. ماہرین کی رائے پر بھی اکثر سوال اٹھانا چاہیئے ۔					

42	Some people are good learners while others have limited ability. بعض لوگوں کے سیکھنے کی صلاحیت کم اور بعض کی ذیادہ ہوتی ہے -					
43	The really intelligent students don't have to work hard to do well in school. قابل ترین طلباء کو سکول میں کامیابی کیلئے سخت محنت کی ضرورت نہیں پڑتی -					
44	Working hard on a difficult problem for a long time only benefits really intelligent students. مشکل مسئلے پر ذیادہ وقت تک کام کرنا صرف ذہین طلباء کو فائدہ پہنچاتاہے۔					
45	If a person tries too hard to understand a problem, he/she will most likely get confused. اگر ایک مسئلے کو سمجھنے کیلئے انسان ذیادہ محنت کرے تو ممکن ہے کہ وہ تزبزب کا شکار ہو جائے۔					
46	You will get during the **first** reading almost all the information from a textbook. ایک ہی بار کتاب پڑھنے سے اسمیں موجود تقریبا تمام معلومات کا پتہ لگ جاتا ہے۔					
47	Usually you can understand difficult concepts if you remove all outside interruptions and really concentrate. عام طور پر ایک انسان مشکل اسباق سمجھتا ہے اگر تمام بیرونی مداخلتوں کو دور کیا جائے اور پوری توجہ دی جائے۔					
48	A really good way to understand a textbook is to re-organize the information according to your own personal scheme. ایک کتاب کو سمجھنے کا اچھا طریقہ یہ ہے کہ اس میں موجود معلومات کو ذاتی سمجھ کے مطابق ترتیب دیا جائے -					
49	Students who are "average" in school will remain "average" for the rest of their lives. وہ طلباء جو سکول میں اوسط درجے کے ہوتے ہیں وہ ہمیشہ کیلئے اوسط درجے کے ہی رہ جاتے ہی					
50	An expert is someone who has a special gift in some area. کسی میدان میں ماہر وہ ہوتا ہے جسمیں اس شعبے کیلئے خصوصی استعداد موجود ہوتی ہے۔					
51	I really appreciate instructors who organize their lectures precisely and then stick to their plan. میں ان اساتذہ کو پسند کرتا ہوں جو پڑھائے جانے والے اسباق کو صحیح ترتیب دیں اور پھر اس پر پابندی کے ساتھ عمل کریں -					
52	The best thing about science courses is that most problems have only one right answer. سائنسی علوم کی اہم خصوصیت یہ ہوتی ہے کہ اکثر مسائل کا ایک ہی صحیح جواب ہوتا ہے۔					

53	Learning is a slow process of building up knowledge. سیکھنا دراصل علم بڑھانے کا تدریجی عمل ہے۔					
54	Today's facts may be tomorrow's fiction. آج کی حقیقتیں کل کے افسانے بن جاتے ہیں۔					
55	Self-help books are not much help. معاون کتابیں ذیادہ معاون/ مدد گار ثابت نہیں ہوتیں۔					
56	You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic. انسان مذید خلفشار کا شکار ہوتا ہے جب وہ کسی عنوان کے متعلق ایک کتاب سے لیئے گئے معلومات کو پہلے سے موجود معلومات کیساتھ جوڑتا ہے۔					

Note: SA: Agree A: Agree NS: Not Sure D: Disagree
SD: Strongly Disagree

D. Teacher Educators' Classroom Practices Observation Scale

The teacher educator tries to ….		Never	Rarely	Sometim	Often	Always
1	Correct learning misconceptions (errors) immediately instead of asking learners to correct them.					
2	Provide many opportunities to prospective teachers to find answers to questions about a lesson themselves.					
3	Deliver lecture in the classroom most of the time.					
4	Facilitate prospective teachers to interact with each other in classroom for learning.					
5	Encourage prospective teachers to remember what he has taught them.					
6	Encourage prospective teachers to read only one material for learning.					
7	Make instruction flexible enough to accommodate individual differences among prospective teachers.					
8	Gives only tests for assessment in classroom.					
9	Prescribe certain methods of teaching which must be applied in every situation in classrooms.					
10	Encourage more discussion in classroom among prospective teachers on the learning objectives.					
11	Keep prospective teachers limited to desks during instruction.					
12	Encourage memorization of information in classroom					
13	Encourage construction of knowledge from learning experiences instead of knowledge transmission.					
14	Provide students with accurate and complete knowledge rather than asking them to discover on their own.					
15	Ask open ended questions to assess understanding.					
16	Use different instructional strategies to meet the individual needs of learners					
17	Impart knowledge and skills to prospective teachers.					
18	Encourage more practical activities in classrooms.					
19	Ask background knowledge in classroom related to the lesson.					
20	Stimulate and value the interpretation of prospective teachers.					
21	Give only research based knowledge to prospective teachers					
22	Link teaching to real classroom situation in schools.					

APPENDIX C

DIMENSIONS AND SUB-DIMENSIONS OF THE EPISTEMOLOGICAL QUESTIONNAIRE

Dimensions	Subsets	Item example	Items NO.
Structure of knowledge	Seeking Single Answers	I really appreciate instructors who organize their lectures precisely and then stick to their plan	30,20,14, 16,19,27,51, 52
	Avoid Integration	I try my best to combine information across chapters	12, 34,15, 28,31,33,48, 56
Stability of knowledge	Avoid Ambiguity	I don't like stories that don't have an ending.	24, 37, 39
	Knowledge is Certain	The only thing that is certain is uncertainty itself.	2,10,54,18
Source of knowledge	Depend on Authority	People who challenge authority are overconfident.	5, 26,32,36
	Don't Criticize Authority	Sometimes you just have to accept answers from an authority even though you don't understand them.	11,6,3,7,40, 41
Ability to learn	Ability to Learn is Innate	Some people are good learners while others have limited ability.	8,42,49,50
	Success is Unrelated to Hard Work	Getting ahead in study takes a lot of work.	23,29,38,43
	Can't Learn How to Learn	Everyone needs to learn how to learn.	13,4,22,25, 55
	Learning is Quick	Successful students understand things quickly.	9,44,1,35,53
	Learn First Time	If I find the time to re-read a textbook chapter, I get a	21,17,46

Speed of learning		lot more out of it the second time.	
	Concentrated Effort is a Waste of Time	Usually you can figure out difficult concepts if you eliminate all outside distractions and really concentrate.	47, 45

APPENDIX D

COVERING LETTER

Dear Sir/ Madam,

I am a PhD scholar at the Department of Education, International Islamic University (IIU) Islamabad. I am collecting data for my research. The title of my study is: **'**Relationship of Teacher Educators' Epistemological and Instructional Beliefs with Instructional Practices: An Analytical Study. The study aims to investigate teacher educators' beliefs and find their relationship with classroom practices. My study is being supervised by Dr. Azhar Mehmmod and Professor Dr. Nabi Bux Jumani, Department of Education, IIU, Islamabad.

As you know that B.Ed. honor and ADE curricula are being implemented in RITEs and universities. No one has investigated the beliefs and practices of teacher educators. It will be significant for the curriculum developers, trainers and teacher educators themselves. You have been chosen as participant in the study because you have been teaching B.Ed honor/ADE curricula in your institution. I hereby assure you that your participation will not affect you in any way. You responses will be kept confidential and they will not be shown to anyone or used for another purpose except this research. However, your participation is voluntary. You can withdraw your participation at any time from the study.

You will participate in a questionnaire survey. You may give your response which best represent your belief about knowledge and instruction and what you practice actually in classroom. Your honest reply will give validity to the study. There is no right or wrong answer. The questionnaire will take about 40 minutes to complete. Later on, if you agreed, the researcher would like to observe your class. The observation will last for one complete class.

The results of the study can be shared with you after analysis. The result of this study will be written up as PhD thesis. Please note that your name will never be disclosed in the thesis or later on in publications. You will be referred through by pseudonym where necessary in thesis or publications in future.

You can contact the researcher for any further query or more information about the research. You can send me an email at: educationmkd@gmail.com or you may call at: 923469352243. If you decide to participate, please put in your signature on this form below. Thank you for sparing time from your busy schedule for reading this letter. Your cooperation and participation will be highly appreciated.

Best regards,

Itbar Khan, Ph. D scholar,

International Islamic University Islamabad.

I, Mr./Ms./Dr.---------- hereby agree to participate in the study

Signature of participant: ----------

I hereby give my consent if the researcher wants to observe my class.

Name and Signature: _____

APPENDIX E

LIST OF INSTITUTIONS

A. Universities

1. Department of Education, University of Malakand, Lower Dir
2. Department of Education and Staff Training University of Swat, Swat
3. Department of Education, Abdul Wali Khan University, Mardan
4. Department of Education ,Shaheed Benazir Women University, Peshawar
5. Institute of Education and research, University of Peshawar
6. Institute of Education and Research, Kohat University of Science and Technology
7. Institute of Education and Research, Gomal University DI Khan
8. Department of Education, University of Haripur at Haripur
9. Department of Education, University of Hazara, Hazara

b. Regional Institutes of Teacher Education (RITEs)

1. RITE (Male) Peshawar
2. RITE (Male) Mardan
3. RITE (Male) Kohat
4. RITE (Male) Haripur
5. RITE (Male) Bannu
6. RITE (Male) Chitral
7. RITE (Male) D.I.Khan
8. RITE (Male) Dir Lower
9. RITE (Male) Thana, Mkd
10. RITE (Female) Abbottabad
11. RITE (Female) Mansehra
12. RITE (Female) Barrikot, Swat

13. RITE (Female) Peshawar

14. RITE (Female) Dir, Rehanpur, Tamargara

15. RITE (Female) Charsadda

16. RITE (Female) Swabi

17. RITE (Female) D. I. Khan

18. RITE (Female) Bannu

19. RITE (Female) Dargai, Malakand

20. RITE (Female) Kohat

APPENDIX F

RECOMMENDED COURSE FOR BELIEFS AND APPROACHES TOWARDS TEACHING AND LEARNING

Title: Beliefs and Approaches towards Teaching and Learning

This course concentrate on the instructional and epistemological beliefs of teachers and teacher educators. At the end of this course the learners would be able to;

a. Understand the basic concept of epistemology and epistemological beliefs
b. Understand the applied models in instructional and epistemological beliefs
c. Apply the epistemological beliefs models for the reformation of students' epistemological and instructional beliefs
d. Adopt constructivist instruction and epistemological beliefs

Unit 1: Beliefs and their implication

1.1 Define beliefs in different contexts.

1.2 Importance of beliefs

1.3 A brief description of major religious beliefs

1.4 A brief description of major political beliefs

1.5 Formation of beliefs

1.6 Changing beliefs

Unit 2: Epistemology

2.1 Etymology of epistemology

2.2 Epistemic

2.3 Sources of knowledge

2.4 Formation of Personal epistemological beliefs

Unit 3: Models of Epistemological Beliefs

3.1 Perry's Developmental Model of Epistemological Beliefs

3.2 Belenky Model of Epistemological Beliefs

3.3 Baxter Magolda Reflection Model of Epistemological Beliefs

3.4 King and Kitchener Reflective Judgment Model of Epistemological Beliefs

3.5 King and Kitchener Reflective Judgment Model of Epistemological Beliefs

3.6 Shommer Model of Personal Epistemological beliefs

3.7 Kuhn Argumentative Reasoning Model of Epistemological Beliefs

Unit 4: Instructional Beliefs

4.1 Traditional instructional beliefs and their classroom implication

4.2 Constructivist beliefs and their classroom implications

4.3 Traditional instructional practices

4.4 Constructivist instructional practices

Unit 5: Assessment in Constructivist Instructional Practices

5.1 Constructivist approaches for assessment

5.2 Constructivist approaches for feedback and error correction

5.3 Questioning in constructivist approach

5.4 Constructivist classroom environment

Unit 6. Teaching Practices based on Constructivist approaches

6.1 Constructivist teaching methods

6.2 Feedback in constructivism

6.3 Activities which promote constructivism in classroom

6.4 Lesson Plan for constructivist approaches

Reference Books/Reading Materials

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23. https://www.oecd-ilibrary.org/education/pisa-2015-results-volume-i/students-epistemic-beliefs_9789264266490-graph28-en

APPENDIX G

PERMISSION FOR USING THE EPISTEMOLOGICAL BELIEFS QUESTIONNAIRE

Schommer-Aikins, Marlene <Marlene.Schommer-Aikins@wichita.edu> 4/11/16

to me

Dear Itbar Khan,

I am happy to share the questionnaire and a few articles with you. You have my permission to use the questionnaire. You will need to revise it to be appropriate for you culture. You will also need to pilot test the revised version to confirm that it is culturally sensitive.

I wish you the very best.

Sincerely,
Dr. Schommer-Aikins

APPENDIX H

PERMISSION FROM THE DIRECTORATE OF CURRICULUM AND TEACHER EDUCATION, ABBOTABAD, KHYBERPAKHTUNKHWA

DIRCTORATE OF CURRICULUM & TEACHERS EDUCATION ABBOTTABAD

AUTHORITY LETTER

Mr. Itbar Khan, Lecturer/ Head Department of Education University of Malakand/ Ph.D Scholar International Islamic University Islamabad is hereby authorized to visit Regional Institutes for Teachers Education (RITEs) Male & Female in Khyber Pakhtunkhwa to collect data for research purpose. All Principals are requested to cooperate with the above Scholar.

17/3/15

Director
Curriculum & Teachers Education Abbottabad