GIRLS OUTPERFORMING BOYS IN EDUCATION: A SOCIOLOGICAL STUDY IN KHYBER PAKHTUNKHWA

by

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Reg. No: 30-FSS/PhDSOC/F16

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A Dissertation
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Dr. Hazir Ullah
Department of Sociology,
Quaid-i-Azam University, Islamabad

SUBJECT: INCORPORATION OF THE RECOMMENDATIONS OF FOREIGN AND INTERNAL EVALUATORS IN PHD DISSERTATION OF MR. RAZA ULLAH TITLED "GILRS OUTPERFORMING BOYS IN EDUCATION: A SOCIOLOGICAL STUDY IN KHYBER PAKHTUKHWA"

Sir,

The undersigned pertaining registration number 30-FSS/PHDSOC/F16, Department of Sociology, International Islamic University, Islamabad has completed his PhD dissertation titled "Girls outperforming boys in education: A sociological study in Khyber Pakhtunkhwa" under the supervision of Dr. Hazir Ullah, Associate Professor and Director ORIC Quaid-i-Azam University, Islamabad. It is hereby stated that, in compliance of the recommendations of the foreign and internal evaluators, the undersigned has incorporated all the recommendations in the above-mentioned PhD thesis.

Raza Ullah,
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PhD Scholar (Sociology),
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FORWARDING SHEET

This thesis entitled, “Girls Outperforming Boys in Education: A Sociological Study in Khyber Pakhtunkhwa" submitted by Raza Ullah (30-FSS/PHDSOC/F16) in partial fulfillment of the requirement of PhD degree in Sociology has been completed under my supervision. I am satisfied with the quality and originality of the research work. I allow Mr. Raza Ullah to submit the dissertation to concerned authorities for further process as per rules and regulations.

Date _____

Supervisor _____
Dr. Hazir Ullah

STATEMENT OF UNDERSTANDING

I, Raza Ullah Reg. No. 30-FSS/PHDSOC/F16, student of PhD Sociology, Department of Sociology, International Islamic University Islamabad hereby declare that the thesis entitled, "Girls Outperforming Boys in Education: A Sociological Study in Khyber Pakhtunkhwa" submitted in partial fulfillment for the requirement of PhD degree is my original work, and has not been submitted for any other degree in national or international institution. Moreover, all the sources that I have been indicated, acknowledged by means of complete reference.

Date _____ Signature _____

Raza Ullah

DEDICATED TO

Dr. Hazir Ullah, my supervisor, teacher and academic role model.

List of Abbreviation

AA UW	America Association of University Women
BISE	Board of Intermediate and Secondary Education
CA	Chartered Accountant
GIST	Girls into Science and Technology
HSSC	Higher Secondary School Certificate
KCSE	Kenya Certificate of Secondary Education
KP	Khyber Pakhtunkhwa
NWFP	North West Frontier of Pakistan
NAEP	National Assessment of Educational Progress
OECD	Organization for Economic Co-operation and Development
PCAP	Pan-Canadian Assessment Program
PISA	Programmes for International Student Achievement
ROSE	Relevance of Science Education
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SAS	Science and Scientists
SAT	Scholastic Assessment Test
SET	Science Engineering and Technology
SMT	Science Mathematics and Technology
SSC	Secondary School Certificate
STEM	Science Technology Engineering and Math
TIMSS	Trends in International Mathematics and Science Study
UNICEF	United Nations Children's Fund
UTS	University of Technology in Sydney
WISE	Women into Science and Engineering

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Abstract

The present research examines the girls' outperformance and boys' underperformance in education in the Khyber Pakhtunkhwa (KP) province of Pakistan. The study focuses on boys' and girls' performance in Secondary School Certificate (SSC) and Higher Secondary School Certificate (HSSC) Annual Examinations. The study was delimited to SSC and HSSC examinations under the Board of Intermediate and Secondary Education (BISE) Peshawar, KP. The BISE Peshawar is the largest and oldest education board of the province. Thus, the study results may not be generalized to the entire KP and needs to be understood in the context of urban Khyber Pakhtunkhwa. This research has been carried out with the help of Mixed Method Research (MMR) approach. The data for the study come from results records of BISE, Peshawar and in-depth qualitative interviews with educationists. Quantitative content analysis technique was used for examining SSC and HSSC results. The main focus of the study remained the boys' and girls' performance in SSC and HSSC annual examinations of BISE, Peshawar, KP. Quantitative content analysis informed the collection and analysis of primary data collected from educationists during in-depth interviews. The main focus of in-depth interviews was to get deeper insight of the causes and nature of the gender based performance in education. The study draws upon insight from the work of social learning theorists and feminist approach to gender and education. The key concepts such as 'reward and punishment', 'observation and imitation', 'sex typed behavior', and 'omnipresent nature of patriarchy' were taken into account for informed analysis of primary and secondary data. The study identified sensibility, family surveillance, restricted mobility, lack of access to outdoor activities, limited use of social media as the key reasons of girls' outperformance. The study respondents' pointed to 'more love and freedom', 'father absence', 'excessive use of social media', 'free mobility', and 'engagements in socio-economic activities' as the main reasons of boys' underperformance in education. Similarly,

culture, the influence of parents and family, poor quality of teaching in girls' schools and colleges, cramming style of learning, employments prospects of STEM subjects for girls and preferred teaching profession were identified to be the main factors of girls' poor performance in science subjects. The study recommends: a) culture and people should encourage girls in science and boys in arts and humanities b) Equal stringent parents' surveillance for son and daughter c) recruitment of qualified female science teachers and d) equal learning environment for both girls and boys.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The current study is an attempt to examine the recent trend of girls' outperformance and boys' underachievement in education in Khyber Pakhtunkhwa (KP) province of Pakistan. The province is considered one of the most patriarchal and male dominated societies where, girls are often restricted by cultural barriers and social constraints. Therefore, boys' and girls' access to public domain is not equal. Thus, men hegemony on the public domain is the norm. Like other spheres of life, education in the province is also unequally accessible to boys and girls. Girls are also being faced with problems in getting education. It is also pertinent to mention here that girls in rural areas are facing more problems in the way of education while in the urban centers, they are comparatively facing less problems and challenges (Rasool, 2007).

Despite all these challenges and inequalities in the way of girls' education, girls outperform boys in the Secondary School Certificate (SSC) and Higher Secondary School Certificate (HSSC) annual examinations of Board of Intermediate and Secondary Education (BISE) Peshawar, KP (Aslam, 2009). However, it is important to mention that girls are not performing well in science subjects. In the prevailing socio-cultural context, it is generally believed that girls in Science, Technology, Engineering and Mathematic (STEM) subjects could not perform well. Nevertheless, the issue of girls' underperformance in STEM subjects in the SSC and HSSC examinations of BISE, Peshawar has not yet investigated and researched with empirical studies. The argument is

that there is need of a comprehensive analysis which may identify the deeper reasons of girls lacking behind in STEM subjects.

Despite the lack of research based studies, the emerging outperformance of girls and underperformance of boys in SSC and HSSC examination of BISE, Peshawar, KP has been the topic of discussion in newspapers. For instance, in 2015, the issue of girls' outperformance and boys' underperformance in SSC and HSSC annual examinations has been highlighted without analysis into the reasons of this remarkable phenomenon (Aslam, 2009). As noted earlier, the phenomenon of boys' underperformance and girls' outperformance is not debated and researched in Peshawar, KP because the trend is new and more importantly, most regions of KP, are still struggling with the initial problem of girls' underperformance. However, the results records of SSC and HSSC of BISE Peshawar, published in the year (2002 -2016) displayed the outstanding performance of girls in the mentioned examinations (see chapter 4 for detailed discussion). This study, thus, focuses to explore the reasons of boys' underperformance and girls' outperformance in the SSS and HSSC examinations under the BISE, Peshawar KP. The study also aims to identify the factors of gender differential performance in STEM subjects in the aforementioned examinations.

1.2 Statement of the Problem

Gender reverse change in educational performance is one of the key areas of research in sociology of education and gender issues. A number of studies have been carried out on girls' outperformance and boys' underperformance in education across the globe (Adler et al., 1992; Baru, 2012; DiPrete & Buchmann, 2013; Francis & Skelton, 2005; McDowell & Ray, 2000; Mead, 2006; Niederle & Vesterlund, 2010; Whitney &

Smith, 1993; Wirt et al., 2000). It is pertinent to note that majority of these studies have been conducted in the global north (Francis & Skelton, 2005; Penner & Paret, 2008; Swann, 1992). A recurring conclusion drawn in these studies is that girls outperform boys and secure good grades in school and college level's examinations, albeit they are not catching up boys in STEM subjects particularly in developing countries. The phenomenon, although very significant in Pakistani context, have not received due academic attention and therefore the issue needs due consideration. This study, thus, attempts to examine girls' outperformance and boys' underperformance in key examinations i.e. secondary and higher secondary examinations in KP. In order to examine the prevalence of stereotypical male and female subjects, I also highlighted the subject wise performance of boys and girls in the aforementioned examinations. In KP, very few girls come into STEM subjects and there is huge disparity in the performance of girls and boys in science subjects (see chapter 2 and chapter 4 for detailed discussion). Based on the statistical evidences presented in chapter 4 on girls' poor performance in STEM subjects, this study has explored key determinants and factors of the wider gender disparity in terms of performance in STEM subjects at school and college level's examination of BISE Peshawar, KP.

1.3 Educational system in Khyber Pakhtunkhwa

The educational system in the province of Khyber Pakhtunkhwa is divided into six major levels: Pre-Primary, Primary (Grade one to Five), Middle (Grades Six to Eight), Secondary School Certificate (Grades Nine and Ten), Higher Secondary School Certificate (Grades eleven to Twelve) and University Programmes. Additionally, children may attend *Deeni Madaris* (Religious Institutions) for Islamic knowledge. These *Deeni*

Madaris are also known as religious Islamic schools. There are also non-formal education programs for youth or adults who have little or no access to formal educational institutions (Shams, 2017).

The number of educational institutions for male students is much higher than female students. In Khyber Pakhtunkhwa, the total number of schools is 37,988. Out of these, there are 27,207 public schools with a total enrollment of 3,763,796 pupils both male and female. The private schools in the province are 6,101 with about 1,304,099 pupils and 4,680 are either *Deeni Madaris* or community run and operated schools enrolling approximately 200,185 pupils (Aslam, 2009).

In a recent study, Shams (2017), found that the total number of schools is 28,178 public schools with 17649 boys' schools and 10,529 girls' school. Likewise, the total number of colleges in Khyber Pakhtunkhwa is 158 (94 colleges for male and 64 for female). Moreover, formally, students in the province (KP) attend private or public schools. It is necessarily to mention here that despite of the above mentioned schools and colleges, all are not functional to receive students (Kaiser et al., 2014).

Education standard in Khyber Pakhtunkhwa has been improved noticeably in the recent years but literacy rate in the province is still very low. According to the latest Pakistan Social and Living Standards Measurement (PSLM) Survey 2015, the literacy rate of the province of Khyber Pakhtunkhwa is 53% (Shams, 2017). Moreover, in the same report, he mentioned that the gap between male and female literacy rate is very wide where male literacy rate was 71% and female literacy rate was noted 35% for the same years. Such statistics indicate that girls, when compared to boys, do not have conducive and favorable environment for education in the province.

1.4 Academic Performance

In educational institutions (schools, colleges and universities) academic performance is the students' success (outperformance) or failure (underperformance) in examinations. Academic performance simply means how a student meets the criteria set out by a schools, colleges or universities in the final examinations. It is, therefore, the ability to learn and understand knowledge and lesson and being able to communicate the learnt knowledge verbally or pen down on paper. Academic performance is measured by the final grade earned in the course in examinations. In this study, academic performance is measured on the basis of passing percentage and top positions that boys and girls achieved in SSC and HSSC annual examinations of BISE, Peshawar, KP from 2002-2016.

It is important to mention that the gender gap in academic performance has become the talk of today's research in the field of sociology of education. As mentioned earlier and recap again that gender gap (girls do well) in academic performance is not just endemic to developed and developing nations. In the last 15 years, education in Peshawar, KP, has seen a gender reversal change in academic performance across various subjects. The quantitative content analysis of the results records published in the years from 2002 and 2016 revealed a clear trend of girls' and boys' academic performance in school and college level's annual examination of BISE, Peshawar, KP (see chapter 4 for detailed discussion). The findings of the content analysis revealed that girls outperform boys in general education (see table 4.1, 4.2, & 4.3 in chapter 4). However, girls' performance is not catching up with boys in STEM subjects (see table 4.4 in chapter 4 of this study). In this study, I reviewed and discussed the current empirical and theoretical

scholarship on STEM subjects in different contexts. In order to make it easy for readers, the concept of STEM education is explained below.

1.5 STEM Education

The abbreviation STEM is commonly referred to fields or domains, related to science (Gonzalez & Kuenzi, 2012). The term STEM stands for science, technology, engineering and math subjects but it takes different meanings as the level changes (Breiner et al., 2012). For instance, they further assert that at primary and middle level, STEM subjects is alternative word for math and science curriculum, however, STEM covers physics, chemistry, technology as the level changes from primary and middle to secondary and higher secondary levels. In many sociological studies, STEM is used to reference a set of subjects which are taught at secondary school and higher secondary school such as science, technology, engineering, math, physics and chemistry subjects (Xie et al., 2015). As the focus of this study is at school and college levels, so the empirical studies skimmed for this research on STEM education are limited to the subjects taught at school and college levels (see review of literature for detailed discussion). Therefore, this study uses STEM education to represent the subjects being taught at secondary and higher secondary levels in Peshawar, KP, such as math, physics, chemistry and engineering. Keeping in view the findings of the study (see chapter 5, 6, and 7 for more detailed discussion) and the growing importance of nature versus nurture debate on gender gap in academic performance particularly in STEM subjects in sociology of education, I consider it important to succinctly discuss the debate of nature versus nurture on the gender reversal change in education.

1.6 Nature versus Nurture Debate on Gendered Performance

Despite robust progress of girls in general education, gender disparities favoring boys continued to be crucial feature of STEM education, particularly in developing context. Studies revealed in developed countries the outstanding performance of girls in STEM subjects heated up the debate of nature versus nurture on STEM education. In order to analyze and understand the stances and perspectives of nature versus nurture, it is important to have a concise account of the two dominant schools of thought on gender performance in STEM subjects.

The nature and nurture debate on educational performance began when the former President of Harvard University Lawrence Summers claimed that girls' underperformance in education, especially in STEM subjects are direct response of biological and sex differences between boys and girls. Many feminists took offence and reacted because nature was positioned more highly than socio-cultural factors (Goldenberg, 2005). The former Harvard president is not alone in his controversial view; many other researchers back his claim that there is a direct link between genetic factors and the underperformance of girls in education, particularly in STEM subjects. The nature–nurture debate has continued for several years. Supporters of nature claim that boys and girls are different genetically and this is a fact which cannot be changed.

On the other hand, feminists argued that it is the nurture and not the nature which shapes and constructs the views that girls are not fit for STEM subjects. It is highlighted here that some prominent researchers advocate the views of both school of thought i.e. nature and nurture and believed that both nature and nurture influence girls' performance in STEM subjects (Francis & Skelton, 2005; Gilbert, 2001). One of them is Skelton

Francis and Skelton (2005), who asserted that gender is socially constructed but also supports brain theory. This view is not acceptable to many renowned scholars. For example, Francis (2002) who claimed that gender is not innate but completely socially constructed. She asserted that academic achievement and gender gap in performance in education is the outcome of nurture than nature. It might be argued here that gender gap in education earlier in the 19th century was linked with genetic and physiological differences between boys and girls. Nevertheless, feminists researchers reject the role of genetics and sex differences and claim that theory of brain or sex differences are highly biased and deficit to explain the issue of girls' underperformance in education (Ceci et al., 2009; Clark Blickenstaff, 2005).

Keeping the arguments of nature versus nurture and findings of this research (see chapter 5, 6 & 7) in view, it is argued that girls' outstanding performance in education is a direct response of changing influence of social and cultural factors. In Past, girls were deprived to enter into public domains including education, and they were not getting equal opportunities like boys to get education. The point to be noted here, that, when they get opportunities and culture turned in their favor, they began to outpace boys in education. Drawing on the study findings, it is argued that girls' underachieving in STEM subjects are the direct response of social and cultural factors (see chapter 7). For instance, in developed societies like United Stated and United Kingdom, girls are outstripping boys in STEM subjects due to girls' friendly environment for STEM education (see chapter 2 for detailed discussion). In developing countries, girls don't have access to girls' friendly environment for STEM education, and therefore they fall behind in STEM education in

terms of performance. My assertion here is that girls' underperformance in STEM subjects is linked with people and society perception of STEM subjects and careers.

To sum up the discussion, it is asserted that biological differences are not enough to explain these differences in the STEM education in terms of performance rather these difference are rooted in society (see chapter 7) for more detailed discussion). Throughout history, girls' performance in STEM education has linked with sex differences and social and cultural factors have been ignored. Having said this looking at the history of girls' education is worth considering. How was it started and how initially their rights to education and underachieving were linked with biological and sex differences?

1.7 History of Girls' Education

The Foster Act, 1870 of the United Kingdom, is the first education act in the history presented schooling system where children of age group (5-10) were imparting education. Initially, these schooling systems were introduced for the children of working class background but later on, lower middle class also sent their children to these schools. The Foster Act was indeed a milestone in the campaigning of education for all. However, it is important to mention that still education for girls was a debatable issue (Richardson et al., 1993). It was debated and challenged on the basis of natural and biological differences between boys and girls. For instance, many scholars argued that female physique is not appropriate for education and the profession associated with education. (Acker, 1987) cited in (Richardson et al., 1993) that:

> The idea of making a boy's attainments the standards by which to measure the girl's is indeed obviously unfair…Not one girl in a hundred would be able to work up the subjects required for an Indian Civil Service

> examination in the way which boys do. Her health would break down under the effort…if she is allowed to run the risks which to the boys are a matter of indifference, she will probably develop some disease which if not fatal, will at any rate, be an injury to her for life.

Feminist historians' intervention made the way clear for girls' education and in 1870s, girls' education commenced despite the fact that it was not acceptable to feminist historians (Cockburn & Clarke, 2002). However, this education for girls was not believed to be similar to that of boys. Dyhouse, (1981) and Purvis (1995) argued that the education imparting to girls largely focused on skills related to their domestic roles. They further mentioned that schools teach girls pupil specific skills which make them confined to domestic chores. For instance, Purvis (1991) argues that main focus was on teaching skills related to domestic chores.

Hence from the very outset, it was obvious that education was never proposed to provide male and female with the same skills and abilities. For instance Richardson et al., (1993) mentioned in their book *Introducing women's studies: feminist theory and practice* boys were teaching the skills necessary for labor market while girls had to learn the skills to look after their men folk and children.

To conclude the discussion, it is asserted that education in early twentieth century was male centered and supportive. Later on, due to continued struggle of feminists, education for all became the foundation aim of the education act of 1944-The Butler Act (Troyna, 1987). He further asserted that this Act emphasized that education should be imparted irrespective of the sex and class differences. However, still till 1990s, girls were discriminated on the basis of sex and innate differences. After 1990s, few girls in UK and

US, got friendly study environment (see chapter 2 in this study). It was found that girls achieved higher grades than boys in tests (Richardson et al., 1993).

After discussing the key concepts of the study, the objectives of the research are given below.

1.8 Objectives of the Study

The study has been carried out with the following objectives.

- To examine the trend of boys' and girls' educational performance from 2002-2016 in Secondary School Certificate (SSC) and Higher Secondary School Certificate (HSSC) examinations,
- To unpack the underlying reasons of boys' under-achievement and girls' outperformance in SSC and HSSC examinations,
- To analyze subject-wise performance of boys and girls in SSC and HSSC examinations,

The research was guided by the aforementioned objectives and the following three research questions.

1.9 Research Questions

- What is the trend of boys' and girls' educational performance in SSC and HSSC examinations?
- What are the various reasons of boys' underperformance and girls' outperformance in education?
- How do boys' and girls' academic performance differ in various subjects?

1.10 Significance of the Study

This study, as mentioned in the start of this chapter, is aimed to explore the underlying factors of girls' outperformance and boys' underperformance in the SSC and HSSC examinations of BISE, Peshawar, Khyber Pakhtunkhwa. Drawing on the findings of the study, I assert that this research gives theoretical as well as practical insights to the field of sociology of education.

At theoretical level, this study, I believe, is very important and significant. The gender gap in terms of academic performance in education is an important issue to be explored not merely that it is an important facet of educational disparity, but more importantly it also causes disparity in the gender wage gap in the market. Moreover, this draws attention to the girls' outperformance and boys' underperformance in education in Khyber Pakhtunkhwa because such issues have not been given due consideration in Peshawar, KP. Similarly, the study has explored some important reasons of gender differences in educational performance of girls and boys at school and college levels in Peshawar, KP. The findings of this thesis provide new insights into the issue of gender differential performance in examinations at school and college level in Pakistani society. Above all, it is a foundational study for future research because girls' outperformance and boys' underperformance is an under examine phenomenon in education in Pakistani society. The study findings add some interesting factors of gendered performance to the existing literature on the issue of girls' outperformance and boys' underachieving in examinations. The study also provides key determinants of girls' poor performance in STEM subjects. Thus, the findings of this research are important addition to the existing body of knowledge in the field of sociology of education and gender issues. The study

may also be helpful to the researchers and scholars that may have interest in the study related to gendered academic performance in different societies.

Besides this, the study also provides some important practical insights. For instance, the policy makers may use the findings of this study to improve boys' performance in education and girls' performance in STEM subjects. The study findings suggest that educational policy in the country may be revisited to overcome gender disparity in the field of STEM education (see chapter 4 for more detailed discussion).

1.11 Organization of the Study

In order to keep coherence in my study and engage the readers, the current study has been organized into eight chapters. A brief account of each chapter is given in the forthcoming paragraphs.

Chapter one is a concise introduction to the study. The introduction places the debates into context. It gives a brief discussion of boys' underperformance and girls' outperformance in SSC and HSSC examinations of BISE Peshawar, KP. It goes on to consider why do girls underperform in STEM subjects? The chapter then presents statement of the problem, a succinct account of educational system in Peshawar, followed by academic performance, brief explanation of STEM subjects and nature versus nurture debate on gender and education. The chapter then offers views on how girls' education started and how they were deprived of education in the past on the basis of sex and biological differences. The chapter ends with study's objectives, research questions and significance of the study.

Chapter two presents a comprehensive review of literature. It focuses on girls' outperformance and boys' underperformance in education. The review of literature

encompasses books, journals, articles and newspapers. Moreover, the review for this chapter covers empirical studies from across the world. The review of this academic endures is divided into three parts: **a**) empirical review, **b**) theoretical review and **c**) theoretical framework. The empirical review skims research studies on the issue of girls' outperformance and boys' underperformance across different socio-economic context. It also encompasses empirical evidences on gender differential performance in science subjects at school and college level. I wrapped up the argument by discussing the issue in the context of Pakistani society.

The chapter then considers theoretical and philosophical arguments circulated in the field of sociology of education. The chapter begins with biological explanation of gendered performance in education. The philosophical work of Dr. Edward Clarke Geddes and Thompson and Rogers discussed in details and linked their work with the gendered performance in education. The work of feminist scholars on gender and education is also discussed with specific focus on the work of Francis, Mary Wollstonecraft, Kitt Millet, Eccle, Simone de Beauvoir, and Nancy Cott with girls' outperformance and boys' underperformance in education. Likewise, social learning, cultural and psychodynamic theorists on gender and education are also discussed and debated. The theoretical review and discussion in this chapter guided the research direction and enabled me to develop a theoretical framework for informed analysis of my data. The theoretical framework provides lens for the analysis of data and drawing conclusion from the study's findings.

Chapter three deals with the research methods and techniques adopted for this study. This study used mixed methods research approach, focusing on qualitative

thematic technique and quantitative content analysis of results records. The chapter explains research approaches and choice for mixed method approach. It sheds light on sampling technique and sample size, sources of data, tool of data collection and data analysis.

Chapter four examines and analyses result records of BISE, Peshawar, KP from 2002 to 2016 in line with quantitative content analysis techniques. The chapter offers detailed statistical evidences on girls' outperformance and boys' underperformance in SSC and HSSC annual examinations in humanities and science group (Pre-Medical & Pre-Engineering). The chapter confirms the outstanding performance of girls in humanities and outperformance of boys in STEM subjects.

Chapter Five seeks an explanation for the outperformance of girls in SSC and HSSC annual examinations of BISE Peshawar, KP. The chapter focuses on primary data collected from school and college teachers, principals and Chairman Board of Intermediate and Secondary Education, Peshawar. The chapter presents the views and experiences of the respondents on the deeper causes and reasons of girls' outperformance. The findings in the chapter unpack profound reasons of girls' outperformance in the mentioned examinations of BISE, Peshawar KP. The findings throughout the chapter has been underpinned and supported with empirical and philosophical arguments exist in the field of sociology of education and gender issues. The chapter challenges the stances of biological theory and supports the arguments of social learning and a feminist theorists approach towards gender and education.

Chapter six presents views and perspective of the respondents on the underlying reasons of boys' underperformance in education. The chapter answers to the question why

do boys underperform in SSC and HSSC examinations? The findings of the chapter explored various reasons of boys' underperformance at school and college level's examinations.

Chapter seven gives a detail account of the reasons of girls' underperformance in STEM subjects and boys' poor performance in humanities in the light of the experiences and opinions of the study's respondents (school and college teachers, principals and Chairman Board of Intermediate and Secondary Education, Peshawar). The chapters unearthed various reasons of gendered academic performance across various subjects. The findings of the chapter reveal that the poor performance of girls is a direct response of socio-cultural factors and lack of role model and appreciation for them in STEM fields. The findings of the chapter may be placed in the line of the arguments that challenge essentialist views on girls' performance in STEM subjects. The chapter also found important factors of boys' lack of interest in arts and humanities subjects.

Chapter eight makes an attempt to sum up the study. The chapter presents an informed analysis and discussion. The findings of the study has been linked and supported with theoretical and philosophical scholarship on gender and education. The chapter gives remedies and solutions to the issue of gendered performance in the light of the study findings. The chapter ends with a brief commentary on the recommendations and possibility of work for the future researchers on the issue of boys' and girls' differential academic performance.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Background to the Chapter

It is widely reported that girls are now outperforming boys in school and high school tests and examinations. However, it was not so long ago that girls were underdog in education. For example, back in 1970s and 80s, the issue of girls' underperformance in education has been debated and researched irrespective of the developed and developing nations (Ullah & Ullah, 2019). Nonetheless, this issue for the first time debated from the viewpoints of girls when it got the attention of the second wave feminists. For instance, in 1970s, they debated and explored the issue of girls' poor performance in education with different approach (Mcrobbie, 2004). They challenged biological theories and claimed that study and learning environment are more boys friendly that lead to girls' underperformance in test and examination at school and college levels. They asserted that girls have the ability and can perform like boys if they are given a balancing gender learning environment (Harris, 2012). In the mid-1990s, feminist intervention to improve the gender discrepancy in education tremendously worked and girls got friendly learning environment in the West. For the very first time, the results records of examinations in American and United Kingdom schools went in the favor of girls and confirmed a new gender gap: girls were showing good results and surpassing boys in humanities subjects and also encroaching them with a slight lead in traditionally male terrains, such as science subjects (O'Donnell & Sharpe, 2002). They further asserted that later on, girls' outperformance expended to other societies and the discourse changed from girls' underperformance to boys' underperformance.

Thus, since then, school and colleges began to respond boys' underperformance and girls' outperformance in education both in developed and developing countries (Drudy, 2008; Marks, 2008; I. V. Mullis et al., 2000; Stromquist, 2007; Yao & You, 2018). It is important to highlight that despite of girls' tremendous progress in academic performance in examinations at school and college level, still fall behind in STEM subjects than boys particularly in developing countries (Baker & Jones, 1993; Cole, 1997; Hedges & Nowell, 1995; Yerdelen-Damar & Peşman, 2013). Nevertheless, the issues of boys' underperformance in education are real and should not be underrated especially in developing countries.

Having said this, this review discusses the complex issue of girls' outperformance and boys' underachieving in education with empirical evidences from both the developed and developing countries. The review concentrates mainly on research undertaken after 1980s on the issue of gendered academic performance at school and college level. The chapter is divided in two parts. Part one offers comprehensive empirical evidence on girls and boys differential performance in education. Firstly, the trend of boys' and girls' performance in education in developed and developing context is discussed. Later, the issues pertaining to the topic were elaborated in Muslim world. The studies also skimmed for focusing on the reasons of girls' outperformance and boys' underperformance in education in developed, developing and Muslim countries. The part one also sheds light on the causes of girls' poor performance in STEM subjects. Last but not the least, part one offers succinct commentary on girls' outperformance and boys' underperformance in education in the context of Pakistani society in general and Peshawar, KP, in particular.

In part two, I theorized gender and discussed theories existing in the field of sociology of education around the issue of gender and education. I first explained and debated biological theories and articulated how biological theories were linked with girls' underachieving in education. The chapter then goes on to explore feminists' approach of gender and education. First, I discussed how feminists understanding of gender and education differ from the biological theorists. I specifically discussed the work of Francis, Mary Wollstonecraft, Kitt Millet, Eccle, Nancy Cott and de Beauvoir, and linked their work with girls' outperformance and boys' underperformance in education. I then, discussed in detail psychodynamic, social learning and cognitive theorists on gender and education. In the light of this theoretical account on gender and education, I developed a theoretical framework for informed analysis of my data.

2.2 Empirical Review

Girls' outperformance and boys' underachievement in education have been an issue of great academic interest for the last three and half decades across the globe (Epstein, 1998; E. Smith, 2003; Titus, 2004). Most of the studies have the established agreement that girls outperform boys in education, despite of the stereotypical views that boys are more intelligent than girls. There are global evidences that girls have made considerable gain in all realms and outperform boys on many key educational benchmark across the globe (Adler et al., 1992; Baru, 2012; DiPrete & Buchmann, 2013; Francis & Skelton, 2005; McDowell & Ray, 2000; Mead, 2006; Niederle & Vesterlund, 2010; Whitney & Smith, 1993). Finding from a relatively recent study paints an identical picture; girls are showing good performance in education at school, college and university level (DiPrete & Buchmann, 2013). A study commissioned by the United

States Congress concluded that at college and school level, gender reverse change has been observed in education attainment (Penner & Paret, 2008). According to Marks (2008), girls are now outperforming boys in education in many developed and developing countries at school and college level. This is in line with what is discussed in the world Bank's (2011) report which shows that the gap that once existed between boys and girls academic performance favoring boys, has been eliminated in secondary and higher secondary education. A significant body of literature unpack that such gender reverse change has not been merely observed at school and college level (Burns & Bracey, 2001; Gorard et al., 1999; Jürges & Schneider, 2011; F. Lai, 2010; Warrington et al., 2003; Mike Younger & Warrington, 2007) but also in higher education (Buchmann & DiPrete, 2006; Ewert, 2012; Jacob, 2002; Long et al., 2012; Machin & McNally, 2005; Taylor, 2005). The findings of these studies suggest that girls outperform boys in education at all levels both in the countries of global north as well as global south. Similarly, the gap between boys and girls educational attainment rises with every level and grade in almost all subjects (DiPrete & Buchmann, 2013; Gorard et al., 2001). Thus, in most of the countries, female students have surpassed male students in terms of outperformance at both secondary and higher secondary levels. Keeping the importance of empirical review, the forthcoming discussion turn to exploring empirical evidences on the issue of boys' and girls' academic performance in examination at school and college level in the context of different developed countries.

2.2.1 Boys' and Girls' Academic Performance in Developed Countries

Girls outperforming boys in education has turned into a worldwide trend. For example, in developed countries, the concern has now shifted from girls'

underperformance to boys' underperformance in education. The issue of boys' underperformance is not new in developed countries. For instance, girls' outperformance and boys' underperformance in education has been debated and examined in industrialized countries in early twentieth century (I. V. Mullis et al., 2000; Stromquist, 2007). Girls outshine boys in the key annual examination held at secondary and higher secondary levels (Drudy, 2008; Marks, 2008).

It is pertinent to mention that in some developed countries, not only girls but also boys are doing well and achieving good grades at both secondary and higher secondary examinations. As mentioned by Marks (2008) and Mead (2006) that there is gender parity in the performance of boys and girls in school and college level's examination. Along the same lines, a follow up study conducted by Maloney et al., (2008). They argued that both boys and girls are showing good results and the gap between boys' and girls' academic performance is not wide. They concluded their study in some industrialized societies, there is no significance differences in the performance of boys and girls. Brown and Gilligan, (1993) gave interesting findings in their study that girls are leading boys with light margin in term of securing good grades, but they outnumber them not only in schools and colleges but also in higher educational institutions. To get a clear picture of girls' outperformance and boys' underperformance, the forth coming discussion turns into the debate in the context of different developed countries.

In the United State of America, girls are constantly performing better than boys in terms of educational achievements at school and college level's examinations (Legewie & DiPrete, 2012). They asserted that in the last two decades, girls outshined boys and secured good grades and marks. The findings of their study found that the passing

percentage of girls in examination is significantly high than boys. They concluded their study with the assertion that the outperformance of female students has not only observed and experienced at school and college levels but also found at the university level. The similar findings have been discussed by Andres et al., (2007) in their study on *Educational expectations, parental social class, gender, and postsecondary attainment*. They argued that the outperformance of girls' student has observed at all levels of education. Penner & Paret (2008) assert that girls are doing well than boys in school, college and university's examination and beating boys with huge margin. These findings suggest that girls are securing good grades at all levels of education. To conclude the above cited study, it is stated that in United State of America, the issue of girls' underperformance has been replaced by boys' underperformance. Girls have dominated boys in terms of academic performance at all levels of education.

The educational system in Canada has also accepted the gender reversal change at secondary and college level. There are many studies that reveal that young girls are outscoring boys in school and college based examinations (Marks, 2008; Renold & Allan, 2006; Mike Younger & Warrington, 2007). They unanimously argued in their studies that the passing percentage of girls is significantly increasing, especially at school and college examinations with each passing year. For instance, Marks (2008) in his study on *Accounting for the gender gaps in student performance in reading and mathematics* asserted that in the last one decade, girls are leading boys with enormous gap in the examinations at schools and college levels. These findings are in conformity with the results of the Pan-Canadian Assessment Programme (PCAP), which reveal that young girls are constantly showing good performance in the results of the PCAP (Morgan,

2016). These results show that girls have outperformed boys with immense gap and this gap is significantly increasing over time. In summary, the studies discussed, substantiate the outperformance of girls in nearly all level of education. These studies also suggest that gender reversal change in Canadian schools and colleges are increasing with the passage of time.

McDowell and Ray (2000) in their study in United Kingdom context, argued that girls' outperformance and boys' underperformance has been witnessed in examinations held at school and college level. They concluded their study with findings that this gender reversal change was first observed at school and college level and with the passage of time, expanded to all educational levels. The similar finding has been discussed by Glennerster (2002). He states that female students are doing well not only at school and college level but they are also outshining male students on a slight margin at university level. Drawing on the findings given by Glennerster, it is asserted that the gap between boys and girls academic performance is narrow and boys are also showing good results at university levels. In line with this, Healey (2005) in his study *on Masculinity: Men and boy* asserts that female students in United Kingdom have surpassed boys in terms of grades and results, at secondary and higher secondary examinations, and also lead them with a slight margin in higher education. He concludes his study with the assertion that the gender gap in performance is high at school and college level as compared to university. Carrington et al., (2008) argue that girls are outclassing boys in school, college and university examinations and achieving higher grades. This reveals that gender reversal change in education favoring girl students has been observed at all levels, albeit the gap in higher education is narrow. In the past one decade, gap in the performance

increased in the favor of girls in some universities (F. Lai, 2010; Machin & McNally, 2005; Taylor, 2005). In line with Lai (2010) and Machin and McNally (2005), McDaniel (2010) found that the performance gap between boys and girls has increased tremendously in the last one decade especially at school and college level. In summary, it is asserted that girls' outperformance and boys' underperformance in United Kingdom is not of recent emergence like other societies. The empirical evidences found that the gender reversal change in academic performance has seen at all levels of education, however, the gap in higher education is narrow.

In Australia, female students have dominated male students in secondary and higher secondary examinations (Adler et al., 1992; Cantwell et al., 2001). In the last three decades, female students outperform boys and securing good grades (Adler et al., 1992). They further argued that with passing time, this gap is significantly increasing especially at school and college level. They also asserted that in recent years, the gap has turned in the favor of girls and exceeding boys in examination with clear difference. Adler et al., (1992) and Cantwell et al., (2001) concluded their study with the claim that over time this gender reversal change has been expended to university level as well. Whitney and Smith (1993) revealed that boys are performing worse than girls at primary, middle, secondary, higher secondary and university levels. This similar findings has given by Thomson et al., (2012). They assert that girl outscoring boys in reading and results at all levels in education with a high margin. To wrap up the discussion, it is stated that like other societies the issue of boys' underperformance has witnessed at all education levels in the context of Australian society. Building on the empirical findings, it is argued that girls had dominated boys in terms performance in nearly all levels of education.

In the context of New Zealand, boys' underachievement and girls' outperformance in education has been researched and examined. For instance, Fergusson and Horwood (1997) argued in their study on "*Gender differences in educational achievement in a New Zealand birth cohort*" that girls are outstripping boys in terms of grades and results at both school and college level. They further asserted that the issue of boys' underperformance in examination is not of the recent emergence. In the same study Fergusson and Howrood opined that same change in the favor of girls has been seen at university level as well. They mentioned in their study that girls are securing good grades and results than boys in the examinations conducted in universities. They concluded their study with remarks that this gender gap in education in the favor of girls has significantly increased over the past two decades. The point here is that the girl students are doing well in examinations in nearly all levels of education. Thus, building on these empirical findings, it is stated that the issue of boys' underperformance and girls' outperformance in the context of New Zealand is not new one. Similarly, the issue has been the topic of discussion of many researchers.

In Netherland, the identical gender reversal change in education has been observed at school and college levels. This gender reversal change has been discussed and argued by many researchers (Driessen & Van Langen, 2013; Jacob, 2002). It is noteworthy to mention that girls first began to outperform boys at school and college levels. With passing years, they also started to exceed boys in examination at university level. Driessen and Van Langen (2013)**,** state that girls have outshined boys in terms of grades and results in tests and examinations at school and college level. They further stated that outperformance of female students is not only confined to school and college

level but they are also doing well in higher education. They concluded the findings of their study by claiming that girls are doing well in education in terms of grades and results at university level nearly in all subjects. Notwithstanding, the performance of girls at university level has recently improved and the gap is not too much widened. With reference to the work carried out by Driessen and Van Langen (2013), Jacob (2002) revealed that the gap between girls and boys in terms of performance has widened particularly at school and college level. They concluded their studies by arguing that with the passage of time, gender gap in terms of performance is increasing rapidly at school and college levels. Based on these empirical evidences, it is then argued that girls have dominated boys in terms of securing good grades, especially at secondary and higher secondary education. However, as they moved to higher education, their performance is falling and that's the reasons they are not catching up boys with high margin at university levels in terms of securing grades and marks in examinations.

Several empirical studies in context of Germany, document girls' outperformance and boys underachieving in school and college's examinations (Ehrman & Oxford, 1990; Weiler, 2000). They assert in their study, that in the last two decade, girls' educational performance at school and college level has significantly improved. The findings of their study, suggest that girls outscored boys and their passing percentage is much higher than boys. The findings of the study conducted by Ehrman and Oxford also register girls' outstanding performance at university level. The key findings of their studies found that boys like school and colleges, are not catching up girls in terms of securing good grades in the examinations held at university level. Weiler (2000) asserts that female students are frequently showing good results and securing good grades than male students at all levels

and the gap is widening with the passage of time. He concluded his study by asserting that female students have dominated male students at all education level with huge margin. The is in line with what is stated by Allen et al., (1992) in their study on *Multiple indicators of children's reading habits and attitudes: Construct validity and cognitive correlates*. They argued that females have outperformed male not only at college and school level but also at higher education in terms of grades and results. The gender reversal gap in educational institution has widened since last 25 years. They concluded their study by claiming that female students are doing well in examinations at school and college levels and this gap is increasing with every passing year. The findings are in line with what Lounkaew (2013) has observed when analyzing urban–rural differences in educational achievement. The result of his study points to the fact that in the last 5 years gender gap in terms of performance in examinations are widening significantly. To conclude the discussion, it is asserted that these empirical evidences gave a clear picture of boys' underperformance and girls' outperformance in education. The findings of these studies also found the gender differential performance at all levels of education.

The same change has also been observed in French society. Girls are excelling boys in terms of educational achievements at all levels. It is important to mention that the gap is more widespread at school and college levels (DiPrete & Buchmann, 2013).The findings of the study conducted by DiPrete and Buchmann, reveal that girls outperform boys with huge margin at school and college's examination. However, the gap is not widened in higher education. They also asserted that irrespective of the public and private sectors, females' students are continuously showing good performance in examination

held at school and college level. They concluded their findings by emphasizing that at university level, in some subjects, girls are doing well while in other, boys are leading girls in terms of securing good grades. This means that girls when promoted to higher education are not able to maintain their good performance. Based on these findings, it is argued that in French education, there is not a uniform performance i.e. which is merely dominated either by boys or girls. For instance, in school and college levels' examination, the empirical evidences gave a clear picture of girls' outstanding performance. Although, at university levels, boys outscoring them in some subjects, and thus, it is stated that the performance gap in higher education is narrow.

Several studies in the context of Switzerland have documented outperformance of girls students at secondary and higher secondary education. For instance, Holder (2005) asserts that female students are outdoing male students in arts and humanities subjects with huge margin. The finding of the study conducted by Holder (2005) is in line with what Rudd and St Roberts global Education, n.d) highlight that girls are outperforming boys in both French and German languages. They argue in the same study that the performance of both male and female are equal in case of English language. This gender disparity in the performance of boys and girls are widening in the favor of girls students with each passing year. They conclude their study by arguing that this gender reversal change in education first took place at school and college level but later on extended to university and higher education. The cited empirical studies gave mix findings regarding boys and girls performance in education. For example, in the light of these findings, it is argued that girls' performance at school and college level is confined to specific subjects, which are stereotypically labeled as feminine subjects. Boys still showing good

performance except in literature and linguistics. These findings illustrate that girls are still behind in subjects which is considered stereotypically masculine.

A wide disparity in the performance of girls and boys at school and college level has seen in Swedish education system (Lindahl, 2007). The findings of the mentioned studies showed that the performance of female students is far better than male students at all levels including higher education. He argued that this gender reversal change is increasing over the period of time. He concluded his study with the assertion that in last decade, girls' performance has been widened and boys lag behind in terms of securing good grades in examination irrespective of the educational level. Similarly, girls has completely dominated boys in achieving top positions, especially at school and college based examinations (Ringbom, 2007). He further mentioned in his study that female students have maintained the same performance at university level as well. Girls outscoring boys in the examinations held at university levels, however, at higher level, girls are ahead of boys and securing good grades in social sciences and linguistic subjects (Lindahl, 2007). The findings of the study also revealed good performance of girls in other subjects. To sum up the discussion, it is argued that girls outperform boys in term of educational performance. They have outperformed boys at all levels in nearly all subjects. This means that Swedish educational system provides equal opportunities to both boys and girls. This also illustrates that stereotypical image of science as masculine subject is not prevailing in Swedish society.

Steele (1997) on the basis of his study found that in Japan, in the last two decades, a significant disparity in gender performance, especially at school and college level has been seen. He asserted that girls are clenching top positions and their passing percentage

is significantly higher than boys. He concluded his study with the findings that academic performance and achievement in education is constantly high among female students in Japan not only at school and college levels but also at university level. Female students are constantly showing good results and continued to lag behind male students in grades and results in examinations at all levels. Findings from a study conducted by Ladson-Billings (2006) show that the gender gap in terms of educational performance is increasing over the period of time at school, college and higher levels. He found that the gap is wider at school and college levels, however, at higher level, there is narrow gap in the performance of boys and girls. This represents that in Japan, girls are outdoing boys at all levels of education. From the findings, it is stated that in the recent years, the plight of boys underachieving especially at secondary and higher secondary level is widening. Boys are underachieving in some subjects at higher level as well.

There are ample empirical studies that register girls' outperformance and boys' underperformance in China in secondary and higher secondary education (Card & Lemieux, 2001; Goldin et al., 2006a). According to the findings of the study carried out by Card and Lemieux (2001) that in the last 15 years, girls are outshining boys and securing good grades in school and college' annual examinations. They concluded their study with the argument that girls are outscoring boys at university level however, their performance is confined to some specifics subjects of humanities and arts. Cho (2007) argued that girls exceeding boys in terms of securing high grades almost at all levels. He found in his study that in the last 10 years, the percentage of girls' passing has increased particularly at school levels (Ina VS Mullis et al., 2004). Zhao et al., (2012) in their study found that the gap between boys' and girls' performance in examinations is increasing

with the passage of time. On the basis of these studies' findings, it is concluded that girls have dominated boys and securing high grades nearly at all levels of education.

In the context of Hong Kong, the issue of boys' underperformance and girls' outperformance has been observed (Labov, 1990). He mentioned in his study that boys are underperforming at school levels and their performance is worst at college and university level. He found in his study that girls have dominated boys in literally subject almost at all levels. It is important to mention that there are studies which register the outperformance of girls even in the science and math subjects in key urban centers of Hong Kong (Ina VS Mullis et al., 2004). They concluded their studies with the assertion that, although the gap between boys' and girls' performance is narrow in STEM subjects at higher levels but in schools and colleges, girls outperforming boys with huge margin in historically masculine subjects. Findings from the recent study show that with the exception of few subjects, girls outshining boys in nearly all subjects (Xu & Wu, 2015). The findings further reveal that girls are surpassing boys in learning and showing continuously good results in all subjects including math and science at both college and school levels in the recent decades. The gender reversal gap in terms of academic performance has significantly increased at school and college examination in the last one decade (Perry & McConney, 2010). Thus, it is then concluded from the above empirical studies that girl are doing well and outperforming boys at all levels of education.

Brazil have achieved gender parity in primary education (Jacobs, 1996). However, there are few studies that reveal huge disparity, especially at secondary and higher secondary education in favor of girls (Barker, 2005). The findings of the study conducted by Jacobs (1996) show that in Brazilian schools, at primary level, both boys

and girls are doing well but boys fall behind as they promote to higher classes. He concluded that as boys promotes to secondary and higher secondary education, their performance significantly fall while girls maintain good performance also at school and college levels. Boys from low income urban setting, underperform in education and their performance become worse, especially at secondary and higher secondary levels (Chevannes, 2006). Over the year, the disparity in academic performance in the favor of girls' student is significantly increasing at both school and college levels.

2.2.2 Boys' Versus Girls' Performance: Evidences from Developing Countries

The status of boys' and girls' education in developing countries is different than developed countries (Jayawardena, 2016). He further stated that majority of the world illiterates are in the developing countries. The key findings of his study are that developing countries had their own cultural and historical contexts in many ways different from the developed countries. These cultural and historical context impact education in developing countries quite differently than developed countries. For example, Jayawardena (2016) highlighted in his study that in developing countries, access to education, especially for young girls is not widespread, which in turn, leads to high female illiteracy rate. Based on these findings, I argue here that cultural and historical context result gender disparity in academic performance in both developed and developing countries.

Nevertheless, developed and industrialized countries have gender neutral environment, so girls outshining boys even in STEM education which is historically known as masculine domain. This means that in developed word, gender is nothing to do with public domains including education. On the other hand, gender gaps favoring men in

all public spheres, including education, are widespread in developing countries. Developing countries, no doubt, had gender disparity; men are ahead and facing no problems in their way of obtaining education as compared to women. Women, culturally and traditionally, have been at disadvantage position (Jayachandran, 2015). This gender based culture comes in odd with girl education. The important point to be noted here is that despite of the prevalence of such gendered culture and widespread disparities, girls in developing countries in the recent decades have shown tremendous growth in securing good grades in secondary and higher secondary examinations (Grant & Behrman, 2010; McDonald et al., 2011; Mensah & Kiernan, 2010; Ullah & Ullah, 2019). This is in line with what is described by (Alabi & Alabi, 2014). They assert that in developing countries, girls regardless of issues and challenges in their way of getting education are surpassing boys in educational attainments. Based on the findings of these empirical studies, it is asserted that despite of male oriented educational and learning environment, in the last 20 years, girls outstrip boys in securing marks and maintaining high passing percentage. However, when it comes to the field of science education, girls do not catch up boys and they are far behind in STEM field (Xie et al., 2015). Their disadvantage position in STEM education is largely linked with socio-cultural and gendered culture of the developing countries (Sharma, 2003). The key finding of the study conducted by Sharma is that due to culture stereotyped image of STEM subjects, girls lack interest in science. He concluded his study that as culture has given space to girls' education; they are doing well in gender based subjects. This means that girls, once allowed by family, no matter how much problems, they are facing in getting education at societal and cultural level, they prove themselves that they can beat boys in education. This is well depicted

from the findings of the study carried out by (Sharma, 2003). He stated that girls even in less girls friendly environment, doing well in education especially in gender education. The point to be noted here is that the underperformance of girls in STEM subjects is the response of male image of STEM education and people perception towards STEM careers and jobs. Thus, it is argued that girls had the ability like boys and can outperform boys in all subjects, if they are given equal opportunities like boys. To look into the issue of girls and boys academic performance in more detail and in different developing context, the forthcoming discussion turns into the debate on the issue of differential performance in the context of the following developing countries.

In Kenyan context, the issue of boys' underachieving and girls' outperformance has been long researched and debated (Baru, 2012). He asserts that the issue of boys' underperformance is not of the recent emergence. He affirms that female students had dominated and leading boys in examination at school and college level. He also stated that female students have surpassed male students not only at school and college level but also in higher education in terms of grades and results. He concluded his discussion and argued that boys are leading girls in remote and rural regions of the country. Findings from the recent study indicate that female students outstripping boys in terms of achieving high marks and securing top positions not only at school and college level, but also university level (Geiger et al., 2015).This is in conformity with what discussed by (Good, 2000). He found that girls outperforming boys nearly in all subjects taught at school and college level. He pointed out in his study that girls are still underachieving and not catching up boys in passing percentage in rural areas. The similar findings have been discussed by Chege and Sifuna (2006) in their study on *Girls' and women's*

education in KenyaI. They found that boys are outshining girls in rural regions in both school and college based examinations. In summary, it is stated that in Kenyan society, boys' and girls' performance differs from culture to culture. This means that girls in urban regions are doing well because they have friendly educational environment. The findings of the studies cited above, signal towards the impacts of culture and traditions on girls' education in rural areas where they are still underrepresented in education.

In Tanzania, the gender gap in academic performance has now been turned in favor of female students (Nyalusi, 2013). It is worth seeing that this change is not old but in recent years, boys' performance significantly dropped. He mentioned in his study that girls are doing well since last 13 years and dominating boys in getting high marks and top positions in secondary and higher secondary education. The key findings of Nyalusi (2013) study are that girls are outperforming boys despite of the unfavorable environment of education for them. He also asserted that this gender reversal change in Tanzanian educational system has significantly increased in the last one decade particularly at school and college levels. The issue of girls' outperformance and boys' underperformance at school and college level has also been spotlighted by Bils and Klenow (2000) in their study on education level. They found that the gap between boys' and girls' performance has increased in the last 10 years at both school and college levels. They further argued that the passing percentage of boys has been fallen. To conclude the discussion on the issue of boys' and girls' performance in Tanzania, it is stated that girls' outperformance has not yet witnessed and researched at higher education. This means that at higher level, girls are underrepresented in education.

Likewise, in Zimbabwe, girls have been dominated boys in terms of educational achievements (Kabeer, 2005). He asserted that the outperformance of girls has not merely confined to school and college level but they are doing well in higher education as well. He concluded his study that the gap is wider at school and college levels. In line with studies conducted by Kabeer (2005) and McDonald et al., (2011) revealed that girls are surpassing boys in examination held at secondary and higher secondary level in terms of grades and results. They found wider disparity in the passing percentage in the favor of boys in rural regions. For example, they also pointed out in their study that in rural areas, boys are doing well in education. They are doing better and clenching top positions not only at school but also at college level in nearly all subjects. This means that girls are still not getting learning friendly environment in remote regions. Drawing on the empirical evidences, it is argued that if girls were given conducive environment in rural areas, they would not only begin to perform well in examination but would also improve their passing percentage. This seems that the case of boys' and girls' academic performance in Zimbabwe and Pakistan are identical.

Mungoo (2017) study of *Gender and Achievement in Botswana's Basic Education: Exploring Boys' Underachievement* is a landmark work in Bosnia, which found Bosnia the worst country in Africa once it comes to gender equality in terms of performance at school and college level. He argued that boys are underachieving and falling behind than girls to secure good grades. He found that however, boys' underperformance is of recent emergence but significantly increased at all levels. He concluded that the most worrying thing is that boys' underperformance has not received public attention. The empirical studies in great numbers are lacking on girls'

outperformance. Nevertheless, few studies document girls' good performance at school and college level(Dunne et al., 2005; A. Smith, 2010). They found in their studies that girls' performance has been improved in the last one decade. The above empirical evidences illustrate that in Bosnia, however, education system has accepted a shift in form of girls' outperformance. Albeit, overall, both boys' and girls' performance, is not satisfactory, particularly, boys position is at jeopardy.

Boys underperformance and girls outperformance has received due academic attention in Thailand (Hutchison*, 2004). He further mentioned that in the last one decade, the issue of boys' underperformance has been highlighted and debated. He found in his study that boys are lagging behind than girls in getting good grades at school and college based examination. He concluded his study with the assertion that girls are doing significantly better than boys in secondary and higher secondary examinations. In line with what Hutchison (2004) asserted is in conformity with the findings given by Nethanomsak et al., n.d). For instance, they affirmed in their study on *Gender Issues in Education* that girls' outperformance in secondary and higher secondary education. They also mentioned that girls are outclassing boys in terms of grades and top positions nearly at all levels. They concluded that gender reversal change in the favor of girls' students is widening with the passage of time at all levels of education particularly in the developed and urban centers. This means that girls like urban centers, are not demonstrating good results in rural areas. Overall, the empirical studies, I discussed above, represent that in Thailand, girls are dominating boys in academic performance. Thus, it is concluded that education system of Thailand are experiencing disparity in academic performance and more importantly, this is widening in the favor of girl students with each passing year.

Unlike other developing countries, the underperformance of boys and outperformance of girls is a recent trend in Mongolia. The issue of boys' underperformance in Magnolia still needs due academic attention. This is completely unexplored phenomenon and there is lacking sufficient empirical evidences. A small scale study conducted by United Nations International Children's Emergency Fund (UNICEF, 2006). This study gave evidences of girls' outperformance and boys' underperformance in secondary and higher secondary annual examinations. The report also found that at primary level, girls student not only outperform boys but also outnumber them. The key findings of the report are that girls outstripping boys in annual examination at both school and college level and with over time, this gap is increasing, particularly at school level. The findings of the report indicate that girls when promote to higher education, do not maintain the pace of their good performance. Despite of this, the outperformance of girls and underperformance of boys in education in Mongolia is a fact and it needs to be explored and researched.

In India, the gender gap in education in favor of girls has been observed in early 2000 (Grant & Behrman, 2010). They mentioned in their study that in many regions of India, girls are showing good results at all levels of education, especially in urban regions. They also found that in urban centers, the gap is wider at school and college level in the favor of girls. They concluded their study that girl students in backwards regions of the country where they do not have equal access to education are performing worse than boys. Along the same line, a follow up study conducted by Bellamy (2003) found that with exception of few rural regions, there are evidences which confirm the

underperformance of girls' at school and college levels. Girls are underperforming in nearly all subjects in the backwards and remote regions.

Based on the above mentioned evidences in the context of different developing countries, it is asserted that the nature of boys' underperformance and girls' outperformance is different from developed countries. For instance, we saw that in most of the empirical studies in developing context, girls are doing well and securing good grades and marks in the urban centers where they have girls' friendly learning environment. They unlike developed countries are not catching up boys and fall behind in term of showing good performance. Moreover, the issue of gender based performance is of recent emergence in most of the developing countries and therefore lacking sufficient studies and evidences.

2.2.3 Gendered Academic Performance: Evidences from Muslim World

The trend of girls' outperformance and boys' underperformance in secondary and higher secondary annual examinations have been observed in Muslim countries (Aslam, 2009; Else-Quest et al., 2010; Hamdan, 2005; Shams, 2017). It is important to note that in majority of Muslim countries, the issue of girls' outperformance and boys' underperformance in education is of recent emergence. Thus, unlike developed and developing countries, no conclusive evidences are available on this new gender reversal change in education in term of performance. Nevertheless, few small scale studies conducted in some Muslims countries revealed that girls outperform boys in securing good grades in annual examination of schools and colleges (Atakan & Eker, 2007; Morley et al., 2017; Usluel et al., 2008). The key findings of these studies suggest that in majority of Muslim countries, girls despite of having lacking conducive environment,

outperform boys in secondary and higher secondary education. However, according to the findings of these studies, unlike developed and some developing countries, the gap favoring girls, is not widespread. For instance, Atakan, and Eker, (2007) asserted that girls with slight margin beat boys in securing good grades. They also mentioned in their study that unlike other societies, the gap is not increasing significantly. Conversely, few studies (El Saadawi & Sa'dāwī, 2007; Gurbuz & Aykol, 2008) revealed that there are evidences that confirm huge gap, favoring girls, in achieving good grades in nearly all levels.

In summary, it is stated that girls outperform boys in some Muslim countries despite of lacking girls' friendly environment for the study. For example, EI Saadawi and Sa dawi (2007) mentioned in their study that the overall picture shows that in Muslim world, with the exception of one to two countries, do not offer girls' friendly study' s environment. They concluded their study that girls having unfavorable environment for study, still leading boys with considerable margin in terms of achieving grades and positions. To discuss the case and get a clear picture of boys' and girls' academic performance at school and college's examinations, the forthcoming discussion turns into debate on girls' and boys' performance based on empirical evidences in the context of different Muslim countries.

Dayioğlu and Türüt-Aşik (2007) found that in Turkey girls outshined and did better than boys in terms of educational attainments and performance at school and college level. They argued that boys are lagging behind than girls in terms of educational performance. Boys' performance in the recent years has vividly dropped. They concluded their findings with the assertion that girls outperform boys in higher education as well.

However, the gap is narrow at higher level of education. Yenilmez and Girginer (2016) found similar findings that the gender reversal change, no matter low or high, but observed at university level as well. They asserted that girls are dominating boys with good grades in some subjects in higher education with a small margin. They concluded that the passing percentage of girls is better than their male counterpart. The empirical studies, discussed above, showed that girls' performance in education in nearly all levels has been improved. This represents that Turkey, has girls' friendly education system. This means that gender is no longer important in Turkish society. In other words, it could be said that there is no considerable differences in femininity and masculinity, and both girl and boys, having equal access to public domain including education. This in turn, advantages girls and consequently surpassing boys in academic performance.

In Malaysia, the same trend has been observed in educational institutions. Female students are doing well at all levels of education. According to A. Ahmad (2009), female had shown good results with great consistency in Science, English, Malay and even Mathematics. The findings of the study also reveal that girls have dominated boys in nearly all subjects at school and college level. However, at higher level, the gap is not wider once it comes to achieving grades. These findings are in line with the recent study showing that girls are performing well than boys particularly in examination held at primary, middle, secondary and higher secondary levels (Goolamally & Ahmad, 2010). They asserted that boys are also lagging behind at higher secondary and university level, but the gap is consistent and narrow specifically at university level. They concluded that the gap, favoring girls, are doubling with each passing year, especially at school level's examination.

In the case of Indonesia, the girls in the last one and half decade, outshined boys and secured high marks in secondary and higher secondary annual examinations. There are evidences which show that girls are doing well in terms of achieving grades and good results at school and college level (Gove et al., 2017; Stern & Nordstrum, 2014). The findings of their study are that girls are surpassing boys in examinations held at university levels, albeit the gap at university level is narrow. For instance, as the findings of study conducted by Stern and Nordstrum (2014) suggest that girls are consistently doing well in education than boys at school, college and university levels in the past seven years. They concluded that the gap is increasing more rapidly at secondary and higher secondary levels.

In Jordan, as for as male students are concerned, they are underachieving at all levels of education (Harper & Davis III, 2012; Vogt et al., 1987). They found that Jordanian girls are outperforming boys in achieving high grades at all levels of education. The findings of the study conducted by (Else-Quest et al., 2010) revealed that girls students outshine boys and secure almost all top positions in examination held at school and college level. They asserted that girls passing percentage in examination at the mentioned levels is high than boys. They also concluded their study with some interesting findings; girls outperform boys in both rural and urban areas nevertheless, and disparity in academic performance is wider in the urban centers in the favor of girls' students and increasing over time. In line with the findings of the studies (Else-Quest et al., 2010; Harper and Davis III, 2012; Vogt et al., 1987), D. Johnson (2017) argued that girls are surpassing boys in terms of grades at all level of examinations. However, they outdo boys

in school and college based examinations with immense gap and this gap is increasing significantly, especially at school levels.

In Iran, girls have dominated boys in terms of educational achievement and performance. It is important to mention here that empirical evidences are lacking in Iranian context that could affirm girls' outperformance at school and college levels. Nevertheless, findings of ministry of Science, Research and Technology of the Islamic Republic of Iran, in the year 2007, revealed that a leading segment of girls i.e. 51 % successfully qualified the competitive national college entrance examination (Mehran, 2009). Based on the findings of this report, it is argued that girls have improved their performance in education, despite of the fact that they don't have equal access to get education. It is worth considered to argue that the issue of girls' outperformance and boys' underperformance needs considerable attention and the findings of ministry of Science, Research and Technology of the Islamic Republic of Iran are not sufficient to substantiate gender reversal change in education.

The same trend has been perceived in Arab speaking countries including United Arab Emirates, Saudi Arabia, Qatar and Oman (Jha et al., 2012; Twist et al., 2004). The findings of these studies are that girls in the last one and half decade are leaving behind boys in school and college level's examination. They concluded their findings with the assertion that girls' performance is increasing significantly with each passing year. Along the same mark, a study conducted by (Hamdan, 2005),examining the extent and nature of girls versus boys academic performance in United Arab Emirates. He found that boys' performance is poor in education while girls are doing well in the examinations held at school and college level.

Joly and Wadia (2017) in their recent study in the Saudi Arabia context found that girls do better than boys in terms of educational achievements at school and college levels. They concluded their study with some key findings that the performance of girls has tremendously increased in the last two decades and expended to higher education as well. Thus, in a nutshell, it is wrapped up, that Arabian countries where once, girls underperforming in education was the main concern of many researchers. Today, the focus of attention of these researchers is boys' underperformance. This means that like other Muslim societies, Arabian land have also witnessed gender reversal change, favoring girls, in nearly all levels of education.

In case of Morocco, girls have shown good performance in education at schools and college levels (Akkari, 2004). They key findings of Akkari's study are that girls are doing well in only urban regions and they are still underperforming in backward and remote areas. The findings are in conformity with results of the study of (Mji & Makgato, 2006). They found that in rural areas, boys are securing all top positions. They further added that the passing percentage of boys is higher than girls in examinations held at school and college level. The similar findings have discussed in the old study carried out by (Graham et al., 1997). According to the finding of their study, urban girls and rural boys are performing well in education. This means that gender reversal change is quite old in Morocco. The similar finding has highlighted by (Joly & Wadia, 2017) in their recent study, showing that girls in some urban regions are outscoring boys even in examinations held at university and higher level. To conclude the discussion, I argued that urban girls and rural boys are competing in education. This means that rural girls are not getting opportunities and facing problems in their way of achieving education. Based

on the findings, it is then stated that girls' underachieving in education in rural areas, are the direct response of lacking girls friendly learning environment. The findings also indicate that girls' outperformance in urban region is of old emergence but still situation for girls' education is not good in rural and remote areas of the country.

In Bangladesh, female students have outperformed male in educational attainments at school and college levels. It is important to mention that the issue of girls' outperformance and boys' underperformance lacking comprehensive and inclusive empirical evidences in Bangladeshi context. The surprising fact is that the gender reversal change in education is not new and took place before one decade (Ullah & Ullah, 2019). However, empirical evidences are not enough to validate and give complete picture of girls' and boys' differential performance in secondary and higher secondary examinations. According to the findings of the study conducted by (A. Ahmad, 2009), found that girls are dominating boys in terms of grades and results but this outperformance of girls is confined to few subjects. He argued that female students in Bangladesh, especially at school and college level, are consistently showing good results but their interest and performance fall at university level and they are not catching up boys particularly in science subjects. Nevertheless, as highlighted by Ahmad in his study that despite of lacking equal opportunities and girls friendly environment, their performance in examinations unambiguously at school and college level is extraordinary. He concluded his study by arguing that this gender reversal change i.e. girls outperformance, is increasing with the passage of time at school and college level.

Okorie (2017) work on *Assessment of Factors Militating against Girl Child Education in Nigeria* is mile stone in Nigerian context. The findings of his study revealed

that educational system in Nigeria has accepted gender reversal change in the favor of girls' outperformance and boys' underperformance. He asserted that female students are outscoring male students at school and college levels. The key findings of the Okorie's study are that girls are dominating boys mostly in all subjects and their outperformance is limited only to urban regions. He found boys are outdoing girls in examination results in schools and colleges located in rural areas. He concluded his study by claiming that the outstanding performance of boys in rural regions is not merely limited to school and college levels but reflected at the higher level as well.

Based on the findings of empirical studies, discussed above in Muslim world, I conceivably argue that boys' underperformance in education is now omnipresent issue and increasing with each passing year. It is noteworthy to highlight that the extent and nature of the issue, is however, different in various society but still, there are evidences across the globe that affirm the issue of boys poor performance especially at school and college' s level examinations. Like other society, in the context of Muslim countries, we found many empirical evidences that substantiate gender differential performance, where girls are leading boys in securing good grades. Drawing on the findings, it is argued that in Muslim world, in majority of countries, girls do not have conducive and favorable learning environment but still they are doing well in education. Having reviewed the issue in various contexts, the discussion is turned into to the debate on girls' outperformance and boys' underperformance in Pakistani educational context.

2.2.4 Boys' Versus Girls' Educational Performance in Pakistan

There is dearth of empirical studies on the issue of boys' underperformance and girls' outperformance in Pakistan. Nonetheless, a few small scale studies carried out in

Pakistani context, revealed boys' underachieving and girls' outstanding performance (Aslam, 2009; Shams, 2017). This means that the phenomenon of girls' outperformance and boys' underperformance is not only endemic to develop and developing countries but also experienced in the context of Pakistani society. For example, the findings of the study carried out by Aslam, pointed out that in recent years, girls' outperformance and boys' underperformance in education have been observed in key urban centers of Pakistan. The key findings of their study are that Pakistani educational system has experienced gender reversal change in the favor of girls and the gender academic performance gap is increasing with the passage of time. Aslam and Shams concluded their findings by claiming that girls are still underachieving in rural regions of the country. These findings were in line with what Agrawal and Nehajul (2017) had observed when analyzing *Predictors of Academic Performance: Emotional Intelligence and Stream among Graduate Students*. They found that in past 15 years, girls outshined boys in the SSC and HSSC examination in many urban centers. They concluded that girls have dominated boys in terms of clenching positions and passing percentage in general group with huge gap in the SSC and HSS examinations of BISE, Rawalpindi. However, they lag behind in the subjects fall in the field of STEM education. In the SSC and HSSC annual examination held under Rawalpindi Board of Intermediate and Secondary Education (RBISE), girls outshined boys and clenched all the top position in the year 2015 (Aslam, 2009).

Like other urban centers, girls outperform boys in SSC and HSSC examination of BISE Peshawar, KP (see chapter four for detailed discussion). It is argued that the phenomenon of girls' outperformance and boys' under performance and their subject wise

performance has not yet debated and researched in the context of Peshawar, KP. Notwithstanding, the annual examination results showed outperformance of girls in examination at school and college level since last 15 years (see table 4.1, 4.2, 4.3 & 4.4). It could be argued that despite the lack of formal research based studies, the emerging out-performance of girls and underperformance of boys in school and college examinations have been a topic of discussion in newspapers. For example, in 2015, the observer newspapers have only focused and highlighted the trend of girls' outperformance and boys' underperformance in SSC and HSSC examinations without deeper analysis into the reasons of this remarkable phenomenon. It is thus, argued that no article has inquired the reasons and factors of this gender reversal change in education in the context of Peshawar, Khyber Pakhtunkhwa. It is therefore, stated that the issue of boys' underperformance and girls' outperformance is largely ignored area in the context of Pakistani society, particularly in Peshawar, KP. However, the issue has been researched and debated in other societies comprehensively. It is believed that the current study has identified and unpacked extremely important reasons of girls' outperformance and boys' underperformance in Pakistani context.

2.2.5 Factors of Boys' Underperformance and Girls' Outperformance

Much of the literature review focuses on the various reasons and causes of girls' outperformance and boys' underperformance in education (Bailur, 2006; Buchmann & DiPrete, 2006; Charles & Luoh, 2003; Twoli, 1986; Were et al., 2010). They found in their studies that academic performance of boys and girls students are influenced by anxiety, attitudes of the students, culture and norms, type of school, role of teacher, location of the school, self-esteem and family background. These factors have influenced

on students' academic performance. For instance, Myhill and Jones, (2006) identified teachers' role and attitude of students important factor that affect students' performance in examinations. They asserted that teachers differently treat boys and girls which in turn, affect the learning ability of both boys and girls students. They further argued that teachers treated boys more negatively as compared to girls which results in underachievement of boys and higher achievement of girls. Teachers and students interactions are also important and influence learning of the students (Younger et al., 1999). They argued that girls' outperformance is linked with their frequent academic interaction with teachers at school. Some studies unpacked that girls' outperformance in education is closely associated with their lack of involvement in physical fight at school, not missing of classes and demonstrate more serious behavior at school than boys (Thomas & Smith, 2004; Williams et al., 2009). They concluded their studies with similar assertions; girls' students are more serious in their reading and work not only in school but also take interest in doing their homework. George posited that girls are found to be more cautious and doing better than boys in education at all level and grade. In almost similar way Chetcuti (2009) argued that girls' outperformance in education is linked with their hard working and consistency in their reading. There are studies which link the outperformance of girls with their positive attitudes and underperformance of boys with their irresponsible attitudes towards reading and schools (Cox, 2000; Darom & Rich, 1988; Davies, 1989; Francis, 2002; Warrington et al., 2003).

It is important to mention here that factors of girls' outperformance and boys' underperformance vary from country to country. It is pointed that every society has its own socio-cultural context which shapes and constructs people choices and interests

differently. For example, in developed context, as discussed earlier and recap here again that one will find no or little differences in boys' and girls' choices. On the other hand, in developing countries, from the very outset, boys and girls are treated differently and thus, they get different image of society, which in turn influence their choices and interests. Thus, to get in-depth insight and understanding of the deeper reasons of boys' underperformance and girls' outperformance in education in different context, the coming discussion is switching over to the studies carried out in various developed and developing countries.

2.2.6 Understanding the Reasons of Girls' Outperformance in Developed Countries

In context of United States of America, a large body of literature focuses on various factors of gender reversal change in education. For example, the findings of the study conducted by Durden and Ellis (1995) reveal that parents' education achievement is an important factor contributed to the outperformance of their female children in education. On the basis of their findings, they further argued that girls as compared to boys are highly influenced by their parents' status which in turn motivate and inspire them. They concluded that mother education significantly impacting daughter performance at school and college levels. Among the same line, a follow up study carried out by Arellano and Padilla (1996) reveals that female students whose mother are educated influencing and motivating girls in the domain of educational performance. Few studies link boys' poor performance with the shortage of male teachers at school (Carrington et al., 2008). They concluded their findings that this badly impact boys' performance and interest in secondary and higher secondary education. Examining

reasons of boys' underperformance in education. Mbugua et al., (2012) found that boys' underperformance is linked with their involvement in bad companies.

Stromquist (2007) has identified key reasons of boys' underperformance and girls' outperformance in examination at school and college level in United Kingdom context. He asserted that boys' underachievement in education is largely linked with the authoritarian approach for them to be taught. He summarized his study with the argument that teacher behavior with boys is harsh which impacts their learning ability. Some important reasons of boys underperformance are found by Gallagher (1997) in his study *Educational achievement and gender* such as lack of male teachers, gender stereotyping by teachers, assessment favoring girls, boys rejecting authority and girls friendly and conducive environment are contributing factors in boys' underperformance in education. Examining these factors, Gallagher emphasized feminization of teaching profession is one of the key reasons of boys' underperformance in examinations. This is in line with what is mentioned by (Kelleher et al., 2011). For example, they pointed out that children in the age group 7 to 11 had never have a male teacher which influence not only their academic performance but also their interest in study. They concluded their study with the assertion that feminization of teaching profession at school level has led to lack of male role model which adversely affects boys' educational performance especially at school level. Mike Younger and Cobbett (2014) in their recent study of *Gendered perceptions of schooling* unpacked other important factors that lead to differential performance at school and college level. For example, they highlighted that teachers' behavior is friendly towards girls and hostile towards boys. They concluded that such discrimination goes in the favor of girls and therefore, they outperform boys. According

to Dreby, (2007) that parents' attachment with daughter also play significant role in their outstanding performance. He found in his study that parents have greater educational aspiration for their daughters as they think that girls will go other homes. The findings are in conformity with what mentioned by Deary et al., (2007). They argued that girls are guest in parents' home and this make parents more concern about daughter education. Parents due to this perception of daughters going to other home, make them more concern about their educational attainments which in turn motivates and encourages them in their study.

Lee and Holland (1993) examining factors of girls' outperformance and boys' underperformance in examinations held at school and college levels in the context of Northern Ireland. They found that girls' early socialization, make appropriate and consistent with the values prevailing in school and college. They further argued that girls when enter into school, behave in the way that is at the likelihood of learning. They concluded their study' s by asserting that girls are trained and socialized in the way that seriousness and responsibility become the central part of their personality which later on help them in school and college. Gallagher (1997) have mentioned that boys demonstrate anti-school and non-serious behavior in school which comes in odd with their learning. He further argued such behavior of boys come contrary to the values of school and classroom environment. He concluded his findings with the claim that the positive attitudes of girls towards schools, results in their outperformance in education and make them distinctive from boys in educational achievement.

In Swedish schools and colleges, girls' outperformance and boys' underperformance in education is associated with multifaceted factors (Lindahl, 2007).

For example, Lindahl (2007) in his study *Comparing teachers' assessments and national test results* reported that Swedish educational system is favoring female students' more than male and this discrimination badly impacts boys' performance in examination at both school and college level. The similar findings are also highlighted by Lavy (2008) in the way that boys are being discriminated in the examinations conducted at school level. She further affirms that this discrimination is not only limited to school but also practiced at college level. In a comprehensive study on the relationship between gender discrimination and academic performance, Hinnerich et al.,(2011) concluded that boys' underperformance in education is the direct response of discrimination, they receive from their teachers. The findings, I mentioned, indicate two different approaches towards girls' outperformance in education in Swedish context. For example, some researchers have linked girls' outstanding performance with factors that are biased and controversial. Conversely, in some recent studies, there are evidences that link girls' outperformance with their dedication and hard work.

2.2.7 Factors of Gendered Performance: Evidences from Developing Countries

As mentioned earlier that the factors of girls' outperformance and boys' underperformance in education differ from country to country. Every society has their own socio-cultural context which shapes and constructs people choices and interests. For example, developed countries have quite different socio-cultural and historical context from developing world. The factors discussed in developed context, have been influenced by their own cultural and historical context. Thus, to understand and explore the various factors of boys' underperformance and girls' outperformance in developing context, the coming discussion is turning to studies conducted in developing countries.

In Philippine, boys' underperformance and girls' outperformance is linked with their engagement of socio-economic activities (Dunne et al., 2005; Jha et al., 2012; Jha & Kelleher, 2006). They unanimously argued that boys along with their schooling perform labor work to assist their parents in fulfilling the needs of their family which adversely affect their educational performance. This is well explained by Reimer (2012). He asserted that boys engage in various labor forces which intervene with their schooling and study. He concluded his study with the assertion that boys are doing well at primary and middle level. However when reach to secondary level, engage in part time work, which impacts their performance in examinations. Recognition of the parental role in the educational achievements of children has been the subject of interest for many researchers. For instance, Spera et al., (2009) asserted in their study on *Parental aspirations for their children's educational attainment* that parents' check and balance upon children significantly affect the educational performance of their children. They concluded their work with the statement that daughters are under the observation of parents, which prevent them to involve in bad activities. Evidence from a study conducted by Ogbu (2003) reveals that boys whose father live away from home do not take their studies seriously. He further asserted that such students spend less time in their studies which results in their underperformance in test and examinations.

In case of Mongolia, various studies have documented different causes of boys' underperformance and girls' outperformance in education. For example, Alanen and Mayall (2001) found in their study that boys are rude and demonstrating deviant behavior in school, that bring negative consequences on their academic performance. From the research literature there is evidences for the effects of boys' personal freedom, high status

in family and poor performance(P. Brown et al., 2010). They further mentioned that students, who have high status and freedoms, have choices other than education such as arranging parties, celebrating weekend etc. These activities are impacting their educational attainments. Family and cultural beliefs have dramatic effects on girl students' academic performance. For example, Ullah and Ullah (2019) asserted that Mongolia has traditional preferences for educating females. Girls are not living with their parents for longer time and thus the tradition has been to impart them education to ensure their bright future. Keeping in view the factors mentioned above, it is asserted that the role of parent more importantly, father role is important determinant in the educational performance of son and daughter. Similarly, family and cultural traditions advantage girls in education.

2.2.8 Factors of Girls' Outperformance in Education in Muslim Countries

In case of Muslim countries, there are ample studies which focus on the factors contributing to girls' outperformance and boys' underachievement in education (Goolamally & Ahmad, 2010; Yenilmez & Girginer, 2016). Within Muslim countries, factors of girls' outperformance and boys' underperformance differ. For example, like develop and developing countries, Muslim countries have different social-cultural and historical context which differently influence academic performance of boys and girls (Oplatka, 2006).In order to get a holistic picture of the reasons of girls' outperformance and boys' underperformance in different context of the Muslim world, the coming discussion sheds light on the reasons of gendered academic performance in the following different countries.

Goolamally and Ahmad (2010) study on Boys *do poorly in schools* is a milestone work in Malaysian context. They asserted that girls' outperformance is linked with the perception of insecurity that parents have about them. They concluded that boys' underachievement in education is due to less attention from their parents' side as they are not concerned and believe that they will secure good life. This means that parents had trust in male children' capacity to secure a job without getting higher level of education. Examining factors of boys' underperformance, Goolamally and Ahmad's (2010) found feminization of teaching profession at school level is a key reason of girls' outperformance and boys' underperformance.

In case of United Arab Emirates, girls' outperformance and boys' underperformance is associated with a number of factors. Bettinger and Long (2005) linked the underperformance of boy students with lack of male teacher at school levels. They asserted that boys don't have role model and this resulted in their lack of interest in study. This is well depicted by Jha et al., (2012) in their study *Do faculty serve as role models*? The key findings of this study are that boys, who have no role model in their primary education, adversely impacts their interest and performance. Along the same line, DiPrete and Buchmann (2013) explained that due to increase in the number of female teachers at school level, girls' performance has been improved dramatically, however, this badly impacted boys' interest and performance. Building on the findings of the above mentioned empirical studies, it is asserted that feminization of teaching profession at school level has resulted dearth of male teachers. Boys at school levels, due to lack of male role model in the shape of teachers, are at disadvantage which last till secondary and higher secondary education. As in rural areas both boys and girls have

their separate schools in which female teachers teach girls and male teach boys(Abdulla & Ridge, 2011). They further mentioned that boys in rural areas dominating girls in education at all levels. The point to be noted here is that feminization of teaching profession is one of the important factors of gender reversal change in UAE. The factors mentioned above indicate feminization of teaching profession at school level do not come in odd with the culture and education system of UAE. Boys in UAE context are not exposed to role models in school, which badly influence not only their performance but also interest in education.

2.2.9 Boys' and Girls' Subject Wise Performance: Empirical Evidences

According to earlier discussion the gender gap in academic performance, favoring girls, has been witnessed in education across the globe. A substantial body of literature is available on the issue of this gender reversal change throughout the world (Machin & Pekkarinen, 2008). However, it is pertinent to mention here that boys have historically dominated girls, particularly in math, physics and technological subjects with the exception of few developed countries (Alexander, 2010). There are increasing evidences that worldwide boys are likely to perform better than girls in the subjects categorized as science subjects (Ganley et al., 2014; Jacob, 2002; Perez-Felkner et al., 2017). They unanimously asserted that boys are surpassing girls in the subjects of natural sciences, especially physics and math. The findings of their studies are in line with what Sinnes (2006) asserted in his study on *Approaches to gender equity in science education*. He argued that boys outdoing girls in physics and mathematics in the school and college levels' examinations. On the other hand, boys' performance is tenuous in arts and humanities subjects (Card & Lemieux, 2001; Goldin et al., 2006b). The

underrepresentation of girls in the subjects of science and math and boys in humanities is a world-wide phenomenon (Burke & Mattis, 2007; Ceci et al., 2009; Ceci & Williams, 2011). They consistently asserted that the performance gap in some countries such as United States, Swedish and United Kingdom is narrow. However, it is wide in the rest of the Muslim countries. Girls performance have been catching up with boys in the science subjects in west (Baker & Jones, 1993; Jacobs, 1996; Myhill & Jones, 2006). Machin and Pekkarinen (2008) asserted that the gap in science subjects i.e. math, engineering and technology, was once very wide in the favor of male students, and has now been narrowed. Findings from a recent study conducted by Thomson et al., (2012). They found that the results of the assessment test of Trends in International Mathematics and Science Study (TIMSS), confirmed gender parity in the educational performance of boys and girls of the 22 out of 42 countries in the subjects of science and math. Despite of few studies that affirm girls' outstanding performance in STEM subject, they still fall behind in developed and developing countries (Asante, 2010). He cited studies (Hedges & Nowell, 1995; Randhawa, 1994) reveal that overall, boys achieve higher grades than girls in subjects of science and math. In the light of these findings, I do assert that literature about academic performance of boys and girls in science and math subjects exist with diverse views. Looking to such diversity, I switch over the studies carried out in different countries of developed and developing world to have a clear picture of girls' and boys' performance in STEM subjects.

2.2.10 Subject Wise Performance: Evidences from Developed Countries

In United States of America, there are sufficient studies that reveal differential academic performance of girls and boys in STEM subjects (Karp & Shakeshaft, 1997;

Perie et al., 2005). They key findings of the study carried out by Karp and Shakeshaft stated that the boys are doing better in science and math in school and college level's examinations. Based on their findings, they further argued that although boys dominate girls in STEM subjects but the gap is not wide. They found in the Scholastic Assessment Test (SAT) that boys outperformed girls in the portion of mathematics with slight margin. These findings indicate that girls are also doing well in the subjects' related science. Examining girls performance, Perie et al. (2005) registered girls' outperformance in science subjects. In line with the work conducted by Perie et al., (2005), Ajai, (2012) asserts that girls have caught up boys in mathematics in terms of performance. They further added that girls, in some cases, are doing well in the subjects of math and physics in school and college examinations. They concluded their findings with the claim that girls' good performance is only confined to few schools. Nevertheless, in examinations at school and college levels, the general trend of subject wise performance goes in the favor of boys (Eisenhart & Finkel, 1998). They conducted an extensive review of American girls in science and found that girls tended to have a marginal position in science and engineering subjects. They also identified differential performance, favoring boys in the National Assessment of Educational Progress (NAEP) which is one of the popular scale assessments with one mathematic portion, conducted at school and college level. Boys do better than girls in mathematics and science in United States of Americain both school and college's examinations. However, they are not catching up girls in arts and linguistics subjects (Liew & Pong, 2005). McGraw et al., (2006) stated that the gender gap in performance in science subjects is wide in the favor of boys but in the recent years, it went narrow particularly in secondary and higher secondary education. They concluded

that as girls move to higher education, their performance and interest fall in the traditionally male terrains subjects.

Planning and Directorate (2010) report on *Women in science and engineering* in Canada found differential performance, favoring boys with a little margin in examinations held at school and college levels. They key findings of the report are that girls' performance in STEM subjects in the recent years has been improved and they narrowed the gap with boys significantly. The report did not find a considerable gendered performance gap in the mathematics and science subjects. Hyde and Mertz (2009) in their study on *Gender, culture, and mathematics performance* found that the 2006 results of Programmes for International Student Achievement (PISA) registered good performance of male and female in the science portion and there were no significant differences in the results. They asserted that, however, boys with a slight margin lead girls but overall, the gap was not significant and found satisfactory for girls students. Similarly, according to the result of one of the well-known educational assessment program namely Pan-Canadian Assessment Program (PCAP), there is no major difference in the results of boys and girls in the science and math at school level (Lynch & Feeley, 2009). Based on the findings of these empirical studies, it is argued that boys' and girl' performance is same in the context of Canada in secondary and higher secondary education. This means that biological explanation for girls' underperformance in traditionally masculine subjects fail in Canadian context. Based on this, I argue that biology alone accounted for male female difference is not adequate; rather these differences are also embedded in the socio-cultural and historical context.

In Australian context, Forgasz et al., (2000) found that the performance of girl student in STEM subjects has improved in the male stereotypical subjects. The main argument of their study is that the performance gap in science subjects is narrow in secondary education. Examining *Trends and factors concerning gender and mathematics*, Vale (2008)found that boys surpassing girls in science subjects in secondary levels with a slight margin but the gap is wide in the favor of girls in higher education. He argued that the girls' performance and interest at higher level, changed and they take interest in subjects other than science. On the basis of his study's findings, he stated that in assessment tests in Australia, boys have outperformed girls and secured good grades in the portion of math and physics. Thomson et al., (2012)'s study on *Monitoring Australian Year 4 student achievement internationally* gives quite different findings. They asserted that in the educational institutions of the state, New South Wales, the performance of girls and boys are alike in the science and math subjects. They further added that in the state Victoria, both boys and girls are showing the same results in the science and math subjects. Prendergast and O'Donoghue, (2014) go one step ahead and argued that girls have outperformed boys and scored higher grades even in higher education. They concluded their findings in the way that girls are continuously showing good performance in STEM subjects at the University of Technology in Sydney (UTS). To sum up the discussion, it is stated that the overall trend of girls' and boys' performance in STEM subjects is satisfactory. Both boys and girls are doing well in the subjects of science, however, some studies found gap, favoring boys at higher level. There are exceptional cases highlighted in the above empirical studies, that girls are outshining boys even at

higher level. However, generally, studies found both boys and girls, performing well in the subjects of science.

Boys in the United Kingdom outclass girls in science and math subjects particularly at higher s level (Clark Blickenstaff*, 2005). He asserted that the gap between boys' and girls' performance in science and technology subjects is narrow at school level. However, the gap increases in the favor of boys as the level changes. Ina recent study on *Gender issues in mathematics*, Hall (2012) found that in the test, Programme for International Student Achievement (PISA) known as large-scale assessment of the mathematics, boy are consistently outperforming girl students. He further asserted that the gendered results each year has been increasing in the favor of male students in United Kingdom in the subjects of science, math and technology in secondary and higher secondary level of education. It is stated that in United Kingdom there is huge gap in the performance of boys and girls. Unlike other western and advanced societies, girls are still underperforming in UK.

As far as the gendered results in STEM subjects is concerned, in New Zealand, boys have dominated girls in science and maths (Fergusson & Horwood, 1997). The similar findings are also found in the study conducted by (Libarkin & Anderson, 2005). They assert that boys are outperforming girls in science and math in all the assessment tests. They also added that boys are achieving good grades in science subjects in the elementary and secondary levels. Vale (2008)argues that girl students also achieve good grades and results in physics, chemistry and technology subjects in the examinations and tests held at school and college levels. He concluded that girls' performance in STEM is not consistent like boys. Turnbull et al., (2017) asserted that in recent years however,

girls began to outshine boys in scoring in life science subjects (biology & anatomy) but they are behind in physical science i.e. physics, mathematics, engineering and computer science.

In Netherland, boys are outperforming girls in STEM subjects (Driessen & Van Langen, 2013). On the basis on their study's findings, they further stated that girls' performance is getting poorer than boys in STEM education at school and college level. They concluded their study with the argument that the gap is wider in higher secondary and university level. Nosek et al., (2009) stated in their study on *National differences in gender–science stereotypes predict national sex differences in science and math achievement* that the boys have dominated girls in examinations in STEM subjects nearly at all levels. They further asserted that in the last one and half decade, girls' performance at college and university level, improved considerably but the situation is worst in higher education.

Several studies in Scotland reveal the underperformance of girls in the subjects of science and technology (Salisbury et al., 1999). They assert that girls in Scottish schools and colleges are underperforming in the math and physics, however, doing better in biology. Another important facet of the their study was the fact that the performance of girls are worst in higher education and boys not only outperform girls but also outnumber them in classes related science subjects. They concluded their study by claiming that the gap in the performance as well as in the number is increasing with each passing year especially in higher education. Drawing on the findings, I argue that girls' position in STEM subjects is similar to the developing countries. In Scottish context, girls' interest and performance is noticeable and in the recent years, the gap in the favor

of boys particularly in higher education has largely expended. It is evident from the fact that the Scottish evidence does not support girls' outperformance at all levels in STEM education.

In Finland, boys' and girls' subject wise performance differ widely: girls outperform boys in literally subjects while boys lead them in science and numerical subjects (Busch, 2005; Jenkins & Nelson, 2005; Lavonen et al., 2005). In the international studies such as Science and Scientists (SAS) and Relevance of Science Education (ROSE), boys outperformed girls in physics and chemistry however girls' performance was outstanding in the subjects of health, medicine and biology(Jenkins & Nelson, 2005). They further highlighted that boys' performance in health, medicine and biology is not satisfactory. They concluded their findings with the assertion that this gap is wider at higher level. Few studies in the recent years, found gender parity in the performance of boys and girls in STEM subjects at school level (Hausmann, 2009). However, the overall picture of Finland education shows the outperformance of boys in STEM education and girls in arts and humanities.

Many studies in German context, describe variation in the subject wise performance of boys and girls (Brotman & Moore, 2008). For example, they identified that girl students at school and college level underperform in science and math but they are surpassing boys in biology and humanities subjects. Examining girls' *interest and achievement in physics classes*, Hoffmann (2002) found that girls are not catching up boys in the science subjects in school and college examinations. He mentioned that in international tests such as ' Science and Scientists (SAT), girls' performance is

comparatively poorer than boys in the subjects of science, especially in physics, chemistry and math.

To wrap up the discussion on the gendered performance in STEM subjects, it is concluded from the above empirical studies, developed world have almost attained parity in the performance of girls and boys in STEM subjects. In few countries, however, boys dominate girls in science but the gap in their performance is not enormous. This outperformance of girls in male terrains subjects such as physics, math, chemistry and engineering represents that girls' underrepresentation and poor performance was rooted in society' culture and traditions. The girls and boys in most of the developed countries, grow in a culture that is infused with gender balanced power, where masculinity and femininity are no longer matters. Thus developed countries have entire different cultural and historical context from developing countries. To get understanding of the boys' and girls' subject wise performance in developing countries, the coming discussion shed light on the gendered performance in developing countries.

2.2.11 Studies of Subject Wise Performance in Developing Countries

There are evidences that confirm gender disparities in performance gap in SETM subjects in developing countries (Riddell et al., 1991). They asserted in their studies that unlike developed world, girls' performance is worst in most of the developing countries. Sifuna,(2006) and Wambua, (2007) found unanimously in their study that boys' and girls' 'performance varies from country to country in the subjects of science. To make the case clear and get a vivid picture in different countries of developing world, the discussion is turned to empirical evidences, focusing on boys' and girls' subject wise performance.

In case of Kenya, the performance of both male and female students is poor in the subjects of science (Aduda, 2003; Changeiywo, 2000; Duflo et al., 2009; Lenga et al., 2001; Musau et al., 2013; Ndirangu, 2000). The key findings of these cited studies are girls' performance is worst as compared to boys in the subjects of STEM and boys are underperforming in arts and humanities. The similar findings are also depicted by Agesa & Agesa, (2000) and Changeiywo, (2000). They unanimously asserted that there is differential performance across different subjects at all levels of education. Mbugua et al., (2012) assert that boys' performance is somehow good in science subjects both at school and college level. They also argued that the position of girls' performance in STEM education is shaky. Sifuna (2006) and Wambua (2007) found that boys especially at school and college levels are outscoring girls in physics, math and chemistry. They further emphasized that girls do not take interest in the science and math subjects, which impacts their performance. Girls show poor performance in the math, physics and chemistry from the very start and become worse as they are promoted to secondary and higher secondary levels (Ngware et al., 2012). Examining *"Performance determinants of Kenya certificate of secondary education"* Catherine (2011) argued that male students has outscored female students in all Kenya Certificate of Primary Education subjects as well as in all Science courses at the Kenya Certificate of Secondary Education levels. The results of the examination conducted in the years 2004, 2005, 2006, 2007 and 2008, show the outstanding performance of boys in math, physics, chemistry and computer subjects (Amunga & Musasia, 2011). Musau et al., (2013) have also registered the outperformance of boys at both national and provincial level in the Kenya Certificate of Secondary Education (KCSE).

In Tanzania, female students fall behind in science subjects in terms of grades and results at all levels. Nonetheless, the gap is wider at school and college levels. Findings of a recent study conducted by Musau, Migosi, and Muola (2013), reveal that male students are outperforming female students in science and math subjects in the examinations held at schools and college level. They further argued that the gap is widening in the favor of boys with every passing year. They concluded their study by claiming that in urban schools and colleges, the gap is broader as compared to rural schools and colleges. This is in line with what identified by (Kabote et al., 2014)in their study on *Performance in mathematics and science subjects*. They emphasize that male students are outperforming female students in mathematics and other science subjects not only at schools and colleges' examinations but also in higher education. They further opine that boys have dominated girls in grades and results in math and science in the examination conducted during the year 2007 to 2011.

In Zambia, there is dearth of empirical studies on the performance of boys and girls in STEM subjects. However, the issue of girls' underperformance is quite old and observed in 1990s (Sayers, 1994). Female students are showing worst results in the science and math at school level (Kelly, 1999). He asserts that the grades of girls' students in school examinations are lower. On the basis of his findings, he further argued that boys are outshining girls' students in science and math at school levels. He stated that the performance of female students in Science, Mathematics and Technology (SMT) especially in colleges are not satisfactory and the gap in the favor of boys is widening over the time at all levels. He concluded his study with the argument that female students are underrepresented in science, technology, engineering and math subjects in colleges

and universities. Drawing on the findings highlighted by Kelly, I argue that in Zambia STEM education is deemed as male terrain. Girls are not considered themselves fit for science subjects, as the culture and environment around them is infused with discourse, favoring boys. This means that if girls are given friendly and conducive environment for studying and learning STEM education, they will show good performance. As mentioned earlier, girls in the last one decade began to outstrip boys in arts and humanities. They were underperforming in arts subjects before two decades because the culture and environment was not conducive for their education. As the culture became flexible and gave space to girls education, they outshined boys in examinations at held at school and college level. This means that their underperformance in STEM field is rooted in the gendered and patriarchal culture of Zambian society.

In Zimbabwe, girls' performance is very poor in the science and technology subjects. Achievements of girls' students are lower in the science and technology subjects at primary, middle and secondary levels (Riddell et al., 1991). They asserted in their study that the performance gap varies from level to level. For instance, at primary and middle levels, the gap is not much wider. Nevertheless, girls' performance drop significantly as they promote to secondary and higher education. They highlighted in their study that the gap is significantly increasing with the passage of time. They also mentioned that in rural areas, both boys' and girls' performance is not satisfactory in STEM education. Boys and girls are underperforming in STEM education at school and college levels.

Findings in Malawi context give identical picture of girls' performance in science related subjects like other developing countries. For example, Walter (1997) asserts that

girls are struggling in science subjects. He stated that girls unlike arts and humanities subjects fail to show good performance in STEM fields. There are some small scale studies which reveal that only few girl students have done well and outperformed boys in the urban centers in STEM subjects in annual examinations held at school levels (Kalipeni, 1997). He further mentioned in his study that girls have passed the subject of mathematics and physics with good grades than boys. Nonetheless, in rural centers, girls are underperforming in science especially in the subjects of Math, physics and Chemistry (Chamdimba, 2003). On the basis of his findings, he further argued that in rural areas, girls do not come into science subjects and there is huge gender gap particularly at middle, secondary and higher secondary levels. The findings of the above empirical studies represent that Malawi, society is still under the grip of culture and traditions. The strict culture and traditions impact girls in various fields, including education.

In the context of Mozambique, education system have accepted gender reversal change favoring girls' students. However, there are increasing evidences that show girls' underperformance in STEM education (Jha et al., 2012). They asserted that performance of girls is bad both in rural and urban areas in STEM subjects. They further stated that girls' enrollment in science at school and college level is low and boys classrooms are crowded which means that girls lack interest and do not consider STEM an appropriate field for themselves.

In Namibia, boys' and girls' performance are not even across different subjects. For example, boys dominate girls in science and girls are doing well in arts subjects (Mwetulundila, 2000). He asserted that people labeled arts as feminine area and science a masculine one which results subject wise performance gap. The study findings also found

that girls are underperforming in school and college levels both in STEM subjects and Humanities in rural and remote regions. The study carried out by Dickerson et al., (2015)reveal that in recent years, girls have shown tremendous achievements in secondary and higher secondary examinations. In sum up, it is stated that boys are doing well in STEM education at both school and college level.

From the above empirical evidences of developed and developing countries, it is evident that in developed countries, there are no such differences in the academic performance of boys and girls. However, the case is quite different in developing world. Cultural influences contribute to a deficient girls' enrollment and performance in STEM education. People link STEM field with boys and this influence girls' interest and performance. It is therefore, the main conclusion of the discussion is that culture is one of the most significant factors contributing to differential performance in STEM subjects.

2.2.12 Subject Wise Performance of Boys and Girls in Muslim Countries

In Muslim countries, the overall picture of the subject wise performance among boys and girls are not uniform. For instance, in some Muslim countries, research studies reveal parity in the performance of both boys and girls in the historically masculine subjects (Wiseman, 2008). Nevertheless, there are increasing empirical evidences which suggest that in majority of the Muslim countries, boys excel girls in the subjects of science and technology (Niederle & Vesterlund, 2010). In some countries, there are evidences that register the underachieving of both boys and girls. For example, findings of a recent study reveal that the performance of boys and girls are not satisfactory in the subjects of STEM (Ekine, 2013). This means that the performance of boys and girls in STEM subjects greatly varies across different socio-cultural context of the Muslim world.

To have a holistic understanding of the boys' and girls' performance in STEM subjects in different context and culture, the forthcoming discussion considers empirical findings in the following societies of the Muslim world.

As noted earlier that boys and girls are doing well in STEM subjects in some countries of the Muslim world. For example, findings of the study conducted by Schnepf, (2004) in Turkey context, confirms parity in the performance of boy and girls in STEM subjects. He stated in his study that girls, like other subjects, are also competing with boys in the subjects of science and technology. The key finding of his study is that boys and girls are equally doing well in the subjects of science and mathematics at school and college levels and there is no significant gender performance gap. On the other hand, there are studies which investigate gender differences in STEM subjects in the undeveloped region of the country in secondary and higher secondary education (I. V. Mullis et al., 2000). While examining Gender *differences in achievement*, they claim that boys have dominated girls in the historically masculine subjects in rural and traditional societies. Based on the findings of the studies cited above, it is argued that both boys' and girls' have friendly and conducive environment for study which is reflected from their outstanding performance. However, situation is still not in the favor of girls in rural areas and they are not catching up boys in academic performance in science related subjects.

The empirical evidences offers quite divergent picture of boys' and girls' performance in the context of Saudi Arabia (Belal, 2014). Examining boys' academic performance, Belal (2014) found the outstanding performance of boys in STEM subjects. However, the results of his study confirmed the poor performance of girls in science subjects at secondary and higher secondary levels. He concluded that the gap between

boys' and girls' performance is increasing and this gap is wider in rural and remote regions.

2.2.13 Factors of Girls' Underperformance in STEM Subjects

As mentioned earlier that boys' and girls' performance in STEM subjects differ from society to society. Factors and reasons of gender differential performance are highly influenced by gender and culture of society (Spencer et al., 1999). Based on this, it is believed that girls' performance in countries with high level of gender equality, are not that much worse and in some cases they are leading boys in STEM fields. It is asserted that the countries where gender no longer matters and individual grows in culture infused with gender balance power had gender parity in education irrespective of the STEM and other subjects. However, in developing countries, where still gender's influence is prevailing, and therefore, in such countries, girls are underperforming in STEM education. In order to know the deeper factors of girls' underperformance, the empirical studies carried out in the area is discussed on the reasons and factors of girls underachieving in STEM field in the context of the following developing countries.

Kenya is highly gendered society, where boys and girls grow with different choices and interests (Quinter & Edwards, 2011). Boys and girls like other fields also have different choices and interests in the field of education. For example, Mburu (2016) asserts that in Kenya, parents discourage their daughters to study STEM subjects and encourage them to study arts and humanities. He further claimed that this from the very onset develops girls' interest in arts and boys interest in science. He also mentioned in his study that girls constantly showing good results in examination in humanities and arts subjects but they fail to dominate boys in science. The crux of his study is that the

underperformance of girls in STEM subjects is the direct response of highly gendered culture. This is in line with what argued by Twoli, (1986) in his study. He found that that culturally approved sex-typed roles and activities of girls come in odd with Science subjects. Beside this, Kenyan schools particularly girls' schools lack laboratories which negatively impact their performance in STEM subjects (Onsongo, 2009). The findings further revealed that lack of conducive learning environment in girls' schools, influence their interest in all hard subjects. At family and society levels, people attitudes, beliefs and expectation have an impacts on the girls' performance in STEM subjects (Ndirangu, 2000). Sifuna (2006) argues that girls as compared to boys face obstacle in their way of getting SETM education both at family and society levels.

Examining girls performance in science, Sa'ad et al., (2014) found that that girls are underperforming in science related subjects in secondary and higher secondary school in Nigeria a number of reasons have been identified which led to the underachieving of girls in science (Vundla, 2012). For example, Vundla asserted that girls lack well trained science teachers at school levels which impact their performance in STEM subjects. He further argued that from the very start, they lose interest in science as inexperienced and qualified teachers make such subjects bore and difficult for them. This is in line with what argued by Tshabalala and Ncube (2016). They found that inadequate teaching facilities, lack of laboratories and library are the key factors of girls' underperformance in STEM field. He concluded that the stereotypical male image of STEM subjects is badly influencing the girl performance and interest.

Examining factors affecting gender equality in science in the context of Indian educational system Bhatty (1998) identified important factors that affect girls'

performance and interest in STEM subjects. For instance, he found lack of inspirational sources and role models in science related field negatively impacting girls' interest and performance in STEM education. He further argued that girls also have unconducive environment for STEM education, which adversely affect their performance. This means that in Indian context, STEM education is considered appropriate for boys. In the light of the findings discussed above, it is asserted that lack of female role models prove that girls are not taking interest in STEM subjects and jobs.

Iipinge (2014) study on *Socio-cultural factors that influence girls' participation in mathematics in secondary schools* found some key reasons of girls' underperformance in STEM education in Namibian context. He cited Eccles and Jacobs (1986) in his study, who unanimously argued that girls' poor performance in STEM subjects is the response of parental expectation from daughter not to be engineers. They asserted that this expectation of parents discourage girls to come into STEM education. They concluded their findings with the assertion that girls' underperformance is rooted in the gendered and biased culture of Namibian society. Building on Eccles and Jacobs, I conceivably argue that majority of the studies to date mainly focusing on the reasons of girls' underperformance in STEM education, embedded and rooted in culture. It is argued that it is not sex and brain differences that lead to girls' underperforming in science, rather the differences between masculinity and femininity are the key factors of differential performance of boys and girls in science education.

2.2.14 Studies of Boys' Versus Girls' Performance in STEM Subjects in Pakistan

There is dearth of empirical evidences on the subjects' wise performance of girls and boys in Pakistan. However, few small studies revealed that girls' participation and

performance in STEM subjects in Pakistan is worse than other Muslim countries. For example, examining girls' performance in STEM subjects, S. M. Ahmad and Neman (2013) found that girls are still loser in STEM education. They surpassingly argued that girls' performance not only in rural areas is poor but they are also underperforming in the urban areas. In a follow up study, Mujtaba and Reiss, (2015) stated that girls in Pakistan are underperforming in STEM education in spite of the positive move, they have shown in arts and humanities subjects. Findings of a recent study carried out by (Awan et al., 2017) on *Factors Influencing Recruitment and Retention in STEM Education at University Level*, reveal that girls performance in STEM subjects are poor and needs to be highlighted. On the basis of their findings, they further asserted that girls are underrepresented in the discipline of science irrespective of the rural and urban areas. They, however, further argued that the disparity is huge in rural areas due to various factors like lack of parents' interest, strict culture, traditions and people beliefs and perception towards careers associated with STEM subjects. They concluded that in the urban centers, girls are underperforming in STEM subjects but over the time, their interest and performance in the STEM education is gradually and slowly increasing due to a change in the mind setup and cultural transformation. For example, in a recent study, a significant raise in the number of female students choosing STEM subjects has witnessed in some specific schools (Awan et al., 2017). They found that the enrollment rate of girls' students became doubled and moved from 23.74 to 44.2 percent in the year 2010. They concluded that despite of this improvement, still girls are underrepresented in the field of STEM education. The government of Pakistan has kept this on their agenda to eliminate gender disparity in STEM subjects, but due to people perception of STEM

subjects, they failed to eliminate it (Bengali, 1999). It is argued that culture and people do not encourage and accept girls in STEM careers, which in turn results in their underperformance and lack of interest in science subjects. The issue of girls underachieving in STEM subjects is an ignored area in the context of Pakistan. Apart from the above small scale studies, the issue has not discussed and researched. No studies have inquired the factors that lead to girls' underperformance in science. It is, therefore, the current study that has attempted to examine deeper reasons of girls' underperformance and lack of interest in STEM education.

It is explored that the issue of girls versus boys in science related subjects, particularly physics, math, chemistry and engineering in developed, developing, Muslim and Pakistani contexts. The discussion reveals a diverse picture of boys' and girls' performance in science related subjects based on different socio-cultural and historical contexts. Drawing on the empirical evidences citied above, it is argued that majority of the reasons of girls' underperformance in STEM education and boys' poor performance in arts and Humanities subjects are socially constructed and rooted in the larger socio-cultural and historical context of society. For example, in the developed countries, we found gender parity in the performance in STEM subjects. The findings in the developed and industrialized societies revealed that girls are doing well in STEM subjects as the gender is no longer important in such countries. This means that both boys and girls have similar choices, developed and shaped in culture infused with gender balance power.

On the other hand, in developing countries, we saw that girls' and boys' differential performance is due to the perception of people towards femininity and masculinity. For example, as evident from the above empirical studies, in developing

societies, there are huge differences in masculinity and femininity, both boys and girls have different choices, developed on the basis of their gender. Thus, to sum up the discussion, it is argued that girls' underperformance and underrepresentation in STEM subjects support the views of feminists' scholar and challenges essentialists and biological theories. Having said this, now the girls' underrepresentation in STEM subjects is discussed from educational and feminist perspective.

2.2.15 Under-representation of Girls in STEM: From Educational and Feminist Perspectives

Science, mathematics, engineering, and technology is considered masculine subjects, whereas the arts, and humanities are perceived as feminine subjects (Francis, 2002; Segal, 2003). Bebbington, (2002) asserts that across the globe girls are doing well in arts and humanities while underperforming in STEM subjects. For example, Hill et al., 2010 and Segal (2003) asserted that girls are excelling boys in arts and humanities in global north and south. He argued that however, despite of girls' success in arts and humanities, fall in STEM subjects particular in developing world. Findings of a recent study reveal that however, in some developed countries, where there is no influence of gender and culture, girls are catching up boys in performance (Sarseke, 2018). Overall, girls are underperforming in STEM subjects and there is huge gap in the performance of boys and girls (E. Smith, 2011; E. Smith & Gorard, 2011). The divergent picture of girls' performance challenges the biological theories of brain and sex differences and support feminists views of gender and education.

Keeping this diversity in the performance of girls in STEM subjects, Feminist argued that the underperformance and underrepresentation of girls in STEM is direct

response of the perception and belief of people towards STEM subjects rather than simple sex differences (Sarseke, 2018). For example, girls despite of the essentialist and biological theorists' views and observations, are doing well in developed countries (see current chapter for detailed discussion).The questions thus, arise that why do girls outperform boys in STEM in developed countries and why they are falling behind in developing and Muslim countries in STEM education. In developing countries, people perception, cultural, social, economic and socialization factors influences girls' interest and performance in STEM education. The findings of this study lead to the conclusion that girls' underperformance and lack of interest is embedded in gendered culture and society (see chapter 7 in this thesis). This is in line with what Cheryan et al., (2017) argued in their study on *STEM fields are more gendered*. They asserted that individual interests and choices are made within a larger social and cultural structure of the society.

2.3 Theorizing Gendering

Gender is one of the most important social categories for the analysis of society. Before, I engage in the analysis, it is important to give a brief discussion of what is gender. The terms gender and sex are interchangeably used despite the fact that both have different meanings (Reeder, 1996). Sex is a term purely based on biology and tends to remain stable over time. Gender, however, is neither innate nor remains stable. Drawing on the differences, it is argued that gender is acquired through interaction and subject to changes. Similarly, the meaning and construction of gender depend on society's culture and values.

By definition and meaning, gender is quite different concept than sex. Sex is innate and refers to biological and physiological differences between male and female.

On the other hand, gender is learned and encompasses a set of differences between male and female. Similarly, gender refers to the personal traits and social position that members of a society attach to being female or male (Macionis, 2009). According to Gould (1977), gender is socially accepted femininity or masculinity. Oakley (2016) in his book *Sex, gender and society* argues that gender is the social classification of human into masculine and feminine beings. Similarly, the World Development Report (2012) defines gender as "the social, behavioral, and cultural attributes, expectations, and norms associated with being a woman or a man"(Ferreira& Walton, 2005). The concept of gender helps to study the differences in behavior between men and women and to analyze the root of these differences as basically social or biological constructions by the society. Gender is a classifying principle in society and culture. It is a remarkable discriminating tool in the distribution of labour, career, possession, income, education, organizational qualities or diseases.

2.4 Theoretical Approaches towards Gender and Education

There are several theoretical approaches that attempt to explain gender development and how this intervenes with the educational performance of boys and girls. The most important theoretical approaches towards gender development and education are: a) Biological theories b) Feminist approach of gender and education c) Psychodynamic theories d) Social learning theories and e) Cognitive development theories and f) culture theories.

Conceivably, the first endeavor to elucidate differences between male and female was biological theory. The followers of the biological theory claim that sex differences between male and female are the basis of gender differences in educational performance.

These inherent sex differences can be found in three areas: intelligence level, reasoning skills and prenatal hormones. The first two are discussed i.e. intelligence and cognitive differences as they are commonly used in literature in the field of sociology of education and gender issues (Sarseke, 2018).

Scientists have explored that boys' and girls' intelligence levels differ as they have different size of brain (Lynn, 1994). Due to these differences, girls are not catching up boys in education particularly in STEM education that requires more intelligence and reasoning level. This is well depicted by M.-C. Lai et al. (2011). They found that there is difference in the structure and size of brain of both sexes. They argued that the structure of the brain of girls is not equal to the boys' one in terms of reasoning and intelligence. For example, they stated that the brain of male is a type S, which means systemizing and therefore people with brain type S, are interested in reasoning and tend to play with mechanical toys. Similarly, brain of woman is type E which means, empathizing, and such people with type E brain and interested to play with dolls. It is noteworthy to argue that the supporters of brain theory make it a base of the underperformance of girls in STEM subjects. The similar views are further supported by Dr. Edward Clarke. For instance, he in his book *Sex in Education or a Fair Chance for the Girls* argued that women brain are not that much advanced to perform in higher education like men (Seller, 1983).

Another set of biological theories declare differences in cognitive abilities and skills the main reason of girls' underperformance in education. For example, Kaufman (2007) postulated that girls are not good in cognitive and mental reasoning that adversely influence their performance in education particularly in STEM subjects. He further stated

that girls' outstanding performance in in arts and humanities subjects indicates that boys and girls have differences in cognitive and skill abilities. This is in line with what Hedges and Nowell (1995) argued that females are better in verbal and theoretical learning and weak in STEM subjects as their cognitive ability comes in odd with the later domain. Girls lack better cognitive skills which are considered essential in STEM subjects and that's why they fall behind in STEM education (Ceci et al., 2009).

Biological theorists also focus on physiological differences between male and female. For example, they believe that biological differences differently affect the interests and behavior of boys and girls. As argued by Lloyd (2002) that men are physically stronger than women and that's why better see the world than women in terms of ideas and reasoning. Prior to the study of Lloyd (2002), Geddes and Thompson argued that women are sluggish, passive and uninterested in politics and men are energetic, eager and interested in politics because of their biology. Building on the work of Geisler (2004). I assert that previously girls' interest and performance in education was linked with the physical and biological makeup the girls. For instance, Halpern et al., (2007) assert that biological and sex differences affect learning and working ability of girls. They further mentioned in their study that women cannot read mathematics and physics and cannot become airline pilots because of their biology. The biology of girls undergoes various changes when she reaches to the stage of puberty which adversely affect their learning ability (Dahl, 2004). This comes in conformity with the argument of Clark, who related reasoning and learning abilities of women with their menstruation cycle. As Hubbard in his book *"The politics of women's biology*" citing (Clarke, 1884) writes:

> There have been instances, and I have seen such, of females, in whom the special mechanism we are speaking of remained germinal, — undeveloped. It seemed to have been aborted. They graduated from school or college excellent scholars, but with undeveloped ovaries. Later they married, and were sterile (Hubbard, 1990, p. 39).

I cited Clark at such length because today, we see evidences that reveal girls outstanding performance in education (L. M. Brown & Gilligan, 1993). This makes Clark work less important in contemporary scholarship. It is important to mention that his work did not go unchallenged. For example, Thomas Wentworth Higginson pointed out that girls underachievement in education previously was conservatively linked with the female sex and socio-cultural factors was ignored (Hubbard, 1990). He justified his argument by stating that girls in developed countries are no more under the influence of culture. They outperform boys even after reaching to the stage of puberty and thus menstruation does not affect their learning ability. Girls are dominating boys even in traditionally masculine subjects in industrialized countries (see chapter 2 in this study). It is argued that academic performance is deeply rooted in the culture and society rather than biology.

In summary, it is vividly clear from the empirical review that girls are doing well in examination at school and college level irrespective of the industrialized and industrializing countries. This new gender change as mentioned earlier opened a new debate that biology and sex differences are not valid. This supports the claim that gender is socially constructed and the differences between masculinity and femininity matter rather than sex. In past, the social and cultural barriers in the ways of female education

were not discussed with critical lens. Rather, a simple explanation is given that boys are intellectually better than girls circulated through academic and non-academic circles. Despite of biased and narrow approach towards gender and education, biological theories have contributed a lot to scholarship on gender and education. The gender differences in brain construction, cognitive abilities, and personal characteristics have produced a significant amount of empirical and theoretical work. The forth coming discussion will shed light on the debate of boys' and girls' performance from feminists, psychodynamic, social learning and cognitive development theorists' perspective.

Social constructionist, feminists and cultural theorists view gender as social construction. For instance, social constructionists explain that there is no universal different character that is either masculine or feminine. This means that gender is not innate fact but it is socially constructed and that's why it varies from culture to culture. Gender is influenced by many factors rather than biological construction. It is important to mention that if gender is socially constructed then of course masculinity and femininity can be changed. In other words, it could be argued that man can be feminine and women can be masculine as these constructions are highly influenced by social cultural context rather than simple biological and sex differences. Thus, a society when infused with imbalance gender power, creates differences between masculinity and femininity. Having said this, I assert that differences in academic performance of girls and boys are the direct response of the differences between masculinity and femininity. For example, as mentioned by Schippers (2007) in western society, there is no differences between masculinity and femininity, and therefore, girls like boys are competing in all fields including education. The point to be noted here is that wide disparity in the performance

gap of boys and girls in STEM subjects (see chapter 4) in Pakistan is the response of the differences between masculinity and femininity (see chapter 7). This changing nature of masculinity and femininity gives a strong base to feminists to oppose and reject theories of brain and innate differences are the core reasons of gender inequality in academic performance. To have a detailed discussion on gender differences in academic performance from the perspective of feminist scholars, it is noteworthy to briefly explain feminism, branches of feminism and waves of feminism.

Feminism is the advocacy of social equality for men and women, in opposition to patriarchy and sexism (Hooks, 2000). Feminism drew attention to the women inferior position in society. The first wave of feminism started in the United States in 1840s and worked to achieve gender equality in society. However, education for all was the prior motive of the second wave of feminism. For example, Bunkle (2016) argued that second wave feminism basically developed in the environment created due to the Education act 1944. He further asserted that the act was developed to ensure education for all, particularly for girls. According to Bunkle (2016) that most of the prominent feminists of the second wave belong to a generation of women born between 1938 and 49. All these feminists attended grammar schools and universities. For instance, Margaret Forster, Margaret Cook and Ann Oakley were the prominent feminists who attended grammar schools and universities (Bunkle, 2016). They supported and voiced for equal opportunities of girls education. Their struggle and effort paved way for girls' education but still they were facing problems in their way of getting education in highly patriarchal society.

In response to such environment of male dominancy, radical feminism emerged in later 1960s (Whittier, 2010). For example, as argued by Sultana (2010) that radical feminists embraced differences in education between male and female due to patriarchal structure. The radical feminists noticeably argue that patriarchy is not only prevailing in family but it has been extended to all other institutions. All feminists are united on a single point i.e. patriarchy and male dominancy are the key factor of women subordinate position in society including education. Previously girls' failure in all fields including education was linked with biological and sex differences and the differences between masculinity and femininity were ignored. Feminists strongly disagree and state that the differences between masculinity and femininity are due to male dominated and biased culture and norms. Boys and girls are treated differently, which later on extend to every field. According to Francis (2000) the majority of societies are patriarchal and this is the core reasons of differences between masculinity and femininity. This is in line with what Millett argued in *Sexual Politics* that the omnipresent nature of patriarchy and the ways it drew attention to the pervasiveness of patriarchy and to the ways in which it is supported through family and culture are the roots causes of gender inequality in society including education (Millett, 2016). Thus, Millet very emphatically argues that gender inequality in education is not merely tied with sex differences rather this is rooted in the patriarchal culture. This means that boys' and girls' performance in education needs to be understood in terms of the surrounding and culture they have.

In the light of the above discussion, it is argued that in past, girls' underperformance was mainly tied with biological differences but later on when girls in gender neutral society began to perform well, challenged the discourses that support

biological differences. This means that girls' deprivation in society is highly influenced and impacted by patriarchal culture and traditional practices of socialization. Feminists voiced for equal and gender free society where both boys and girls train and grow in equal environment (Ringrose, 2007). They believed that sex differences were over emphasized and social and cultural influences have been undermined.

Building on the work of Francs and Millet, it is asserted that boys and girls are equal by birth and there are no innate differences that cause girls' poor performance and lack of interest in education. Boys and girls, after their birth, get and develop different image of society and this rather than sex and innate differences influence them throughout their life, in terms of their choices and interests. Having said this, it is argued that the basic assumption of the feminist work is that the differences between male and female are more prevalent and influential in making difference in academic performance of boys and girls. The gendered academic performance and girls' underachieving in STEM education are the direct response of gendered and traditional practices of socialization (for more detailed discussion see chapter 7). In developed societies, where gender is no longer important, girls outshine boys even in STEM subjects (Clark Blickenstaff*, 2005). This means that differences between masculinity and femininity set different choices and interest for boys and girls. As highlighted by Blake et al (2011) that girls in traditional and rural societies underachieving in education because education in such societies are not at the likelihood of femininity. The similar views have also supported by Godley (2003) who asserts that context and community cultural values and norm are pivotal in the construction of masculinity and femininity. This masculine and feminine traits which is constructed and developed through traditional practices of

socialization, become the core reasons of girls' underperformance in education. Based on this, it is argued that in urban areas the traditional practices of socialization are weakening. Girls unlike rural and traditional societies are now getting opportunities of approaching public domains, which has changed their role in society. In the field of education, due to this transition, girls are now outstripping boys in academic performance (see review of literature in this study). In developing society, STEM is considered a masculine field badly influencing girls' interest and performance in STEM education. The argument, is thus, based on the assumption that girls' underperformance in education in past was the outcome of girls' inferior and subordinate position in society. As argued by another renowned advocate of feminism, Wollstonecraft in her book "A Vindication of the Rights of Women" published in 1972 asserts that woman has been defined as inferior by man and is not based on reality because her inferior position is largely influenced by societal norms and values. Thus, culture, norms and values are making women inferior and prevent them from entering to public domain including education, although they have similar level of reasoning. Based on the argument of Wollstonecraft, it is argued that culture and societal norms stereotypically considered girls fit for domestic and inferior roles. Education in general and STEM education in particular, are considered public domain and male hegemony, which discourages girls' interest and performance in STEM fields. Boys and girls differences in academic performance in STEM are not innate and biological but the outcome of cultural and societal definition of masculinity and femininity.

This means that no one is born genius or less genius but it is society and culture which make the differences. This is well explained by Nancy Cott in her ‘difference’ and

‘sameness’ debates, asserts that women have the same intellectual qualities like men but due to cultural constrains and patriarchal structure, women do not get equal access to public spheres including education (Cott, 1987). Drawing on Cott, it is asserted that girls' poor performance in education in past (see review of literature review for detailed discussion) was the direct response of cultural barriers and male dominancy over public domains. Thus, to conclude Nancy Cott work, it is stated that its society and culture that make girls inappropriate for public domain including education. This shows that girls when born are treated and grown with a different image of society. It is pointed out that one is not born genius rather made and prepared deliberately in the socio-cultural context. Simone de Beauvoir, who is a French feminist and supports similar views. Simone de Beauvoir' work (as cited in Hossain, 2017) revealed in the following way.

> One is not born, but rather becomes a woman. No biological, psychological, or economic fate determines the figure that the human female presents in society; it is civilization as a whole that produces this creature, intermediate between and eunuch, which is described as feminine (Hossain, 2017).

The above quote indicates that how girls are influenced and associated with inferior roles and positions in society. Women are made rather than being born and societal norms and values are decisive in this construction. In line with this, she further argued in her book in *The Second Sex* that women are "other" in society. Culture and civilization has placed women in inferior position and regarded men superior and considered them normal. It is argued that boys in society is seen as the default, natural, and dominant one; whereas girl is the ‘other’, passive and subordinate, with no distinct

role of her own in life other than that of supporting man and his ambitions. These differences influence girls for entire life. Drawing on this, it is asserted that such differences are more prevalent in developing societies and this is the fact that girls in such societies are lagging behind in education particularly in STEM education.

In conclusion, it is then stated from the above discussion, feminist scholars thus, assert very persuasively that gender is highly influenced by male perspectives and beliefs that later on push girls to marginal positions in society. Feminists strictly oppose and challenge sex and innate differences for girls' underperformance in education. They stated that biological and essentialist views were over emphasized in early 1970s and 80s. As argued by Francis and Skelton (2005) that girls were underperforming in education in 1970s and 80s, as there were huge differences between masculinity and femininity but these were not critically and realistically analyzed.

Psychodynamic theory of gender development has originally given by Sigmund Freud. This theory focuses on family and declares family a key factors which influences individuals' development, specifically their gender identities. It means that the primary relationship of children with their parents in family makes the child able to define herself or himself. On the basis of this, he or she develops the image of society in mind. This theory, thus, explains that the construction of masculinity and femininity is the result of the relationship between mother and children, including both boy and girl. Chodorow (1989) who is well known psychodynamic theorist, stated: "We are all mothered by women and women rather than men have primary parenting responsibilities". It means that mothers influence daughters in the sphere of family in feminine characteristics and thus both boys and girls adopt different path from the very start which later on prevent

female from public domain. This intense closeness of girl with mother influences and shapes daughter in the role of motherhood and rearing and caring of children (Chodorow, 1989). The interaction of mother with their sons is different from daughters. Mothers encourage sons more than daughters and avoid sons in emotional matters (Chodorow, 1989). In short, psychodynamic theorists give immense importance to the relationship of mother and their children in the development of gender identities. When a girl becomes a woman, she reflects her identities in the way that were shaped and influenced in the interaction with their mother. Similarly, a boy turns into manhood, behaves differently.

In summarization, it is argued that early socialization of children is of great importance because it influences the process of gender identity development. Linking this with educational attainment, it is argued that later on this gender identity influences both boys and girls in educational attainment. As it is evident from the review of literature that girls fail to perform in science related subjects as they perceive these subjects male terrains. The traits they develop in their personality come in odd with science subjects. On the other hand, early interaction of sons with parents makes them unfit for arts and humanities subjects. My point of assertion here is that humanities are traditionally associated with femininity. Wang and Degol (2017) assert in their study on *Gender gap in science, technology, engineering, and mathematics (STEM): Current knowledge, implications for practice, policy, and future directions* that STEM field is mainly associated with the traits of masculinity that discourage girls to come into STEM education. They further argued that masculinity and femininity are shaped and constructed in culture which is infused with gender imbalance power. Based on this, I argue here that both boys and girls when open eyes in such environment will definitely

having different choices and interests. In conclusion, it is stated that early socialization and gender role formation push boys and girls in different directions. The crux of the discussion is that girls' underachievement in science subjects and boys' underperformance in arts and humanities is closely linked with their early interaction and the environment in which they are grown and brought up.

Another theoretical perspective toward gender development is social learning theory which is derived from the work of Walter Mischel and Gabriel Tarde (Bandura & Walters, 1977). However, it was further developed by Julian Rotter and Albert Bandura. According to this theory, people learn in a social context through the process of reward and punishment which is also known as carrot and stick approach. For instance, behavior followed by reward will likely to be occurring again and again. This theory further states that sex-typed behavior is also very important in influencing ones gender. A behavior is sex-typed when it is considered appropriate for a specific sex. The second principle of social learning theory which is given by Albert Bandura is imitating or modeling. As mentioned by Bandura that children will imitate and copy individuals most like themselves (Bandura, 1999). Drawing on social learning theory, it is evident that society and culture has given space to girls' education. For example, Kabeer (2005) argued that today girls are encouraged to get education which was once not accessible for them. This means that in past, girls were discouraged and not given opportunities to get education. In the light of the above discussion, it is asserted that girls are rewarded today in the form of appreciation which in turn motivates them to study hard. It is therefore argued that society where girl have equal opportunities of getting education, are exceeding boys even in STEM education (see current chapter).

Similarly, the second concept of social learning theory is imitation and modeling by Albert Bandura. For Bandura, role model plays an important role in learning through observation and imitation. He argues that people imitate other most like themselves. Based on this, it is asserted that today girls have more educated role models around them which positively influence them. Girls are dominating boys in arts and humanities subjects as these subjects are considered feminine domain. Throughout the globe, it is an established fact that girls educational attainment has increased due to higher proportion of female teacher at school (Goolamally & Ahmad, 2010). Girls lack potential female role model in the field of STEM education which badly influence their interest and performance in STEM field. To sum up the discussion, it is stated that role model plays an important role and reinforces learning through observation and imitation.

Cognitive development theory was given by Lawrence Kohlberg, Jean Piaget and Carol Gilligan. This stresses that how children learn from other through interaction and defines their gender. It is argued here that cognitive development theory assumes that children have a pivotal role in developing their identities. Children passes through various stages in developing identities (Wadsworth, 1996). A child from his or her birth till the age of 24 to 30 months, choose different role for himself/herself in response to societal responses. This earlier socialization in masculinity or femininity makes opinion about his or her gender which they think will not change over time (Serbin et al., 1993; Warin, 2000). Levy (1998) argues that children get high internal motivation and learn and adopt role and behavior suit their sex and gender. Boys and girls throughout the course of life, learn behavior and roles considered by society as masculine or feminine. Similarly, one of the reputed social cognitive theorists, Carol Gilligan states that girls are socialized

in the way, which influences them in terms of care and responsibility while boys are socialized in the way which makes them independent from others (L. M. Brown & Gilligan, 1993). Drawing on the theory given by Carol Gilligan, it is argued that such early socialization then leads to differences for both boys and girls, once they step in the public domain. For instance, from the very start, girls consider themselves fit for the roles such as caring, responsibility and other submissive roles. On the other hand, boys do quite different roles which they think normal and appropriate form themselves. Connecting, it with educational performance, it is said that societal cultural and the way parents dealing their boy and girls child, affect their performance in education quite differently. For instance, when they enrolled in schools, the early socialization and gender constancy which is developed in their childhood, benefit boy child in terms of educational achievements in STEM education and girls in arts and humanities. Thus, it is argued here that as in the current time, as girls have been given space and societal norms and values are becoming flexible and moreover, parents mind set up has been changed about girl child, so they are performing and competing with boys in the activities of public spheres including education.

In summary, cognitive development theory emphasizes that early socialization have great influence on children. Most children, then in later life, learn and perform behaviors consistent with their gender. Drawing on the social cognitive development theory, it is argued that girls consider themselves for domestic and private chores as these domains are developed as their gender constancy and boys consider themselves for public domain. The early socialization provides different role model for boy and girls, and thus, develops and learns different role and behaviors.

Cultural theories emphasize on gender socialization and state that boys and girls learn masculine and feminine identities (Martin & Ruble, 2004). It means that society teaches role and behaviors ideal for each gender. Similarly, these gendered ideal roles lead to gender schemas which becomes perspective by which individual sees their social world (Bem, 1981). Gender schemas mean habits of mind that persist through adulthood. Children then unconsciously, indulge in activities suits their gender.

Drawing on the above mentioned theoretical approaches of gender identity development, it is argued that gender gap in educational performance on the basis of biological and sex differences can no more be justified. The rejection of biological basis of gender differences in education performance has been challenged by the vivid outperformance of girls in education across societies. Drawing on the theories of social constructionism, it is stated that the cultural values and norms were male centered and were not giving girls spaces. Similarly, the key work of feminists particularly, liberal feminists show that how societies in past had discriminated girls by dealing boys and girls differently. Having said this, I do believe that biological and sex differences were not the reason in past for girls underachieving in education, but their subordinate position and domestic responsibility for children and family were handicapping them in education.

Later on feminism remained successful by diminishing many barriers to girls' entry in education, especially in developed societies, however, they have not been able to overcome the prevailing beliefs in developing world that man and woman are intrinsically different. The point to be noted here is that girls in developing world are still far behind in STEM education due to such beliefs and perceptions. To sum up, feminism

is paramount and justifiable to the issue of gender inequality in education as compared to biological and sex differences.

Similarly, psychodynamic, social learning, cognitive development and cultural theories connect women to inferior positions in society with socialization, culture, interaction and the role of role model. Connecting these with girls' education in the past, it is argued that these things were in favor of boys and therefore girls were not heading boys because they were not provided opportunities. In recent times, when people gave due attention to girls socialization, girls are not only competing boys but also outperforming them in public spheres activities including education. Thus, it is evident that the difference in competency and intelligence does not exist in biological characteristics but in opportunity and social environment.

The above comprehensive review of literature particularly theoretical and philosophical review has helped in developing the theoretical framework for this study. I borrowed some key concepts such as reward and punishment, observation and imitation, sex-typed behavior, patriarchy and "other" from theoretical review. The forthcoming discussion tells that how these concepts give theoretical foundation to this dissertation.

2.5 Theoretical Framework

This section provides theoretical underpinning to the study and analysis of data presented in chapters 4, 5, 6 and 7. The theoretical framework consists of key concepts, borrowed from theoretical review skimmed for this study. These concepts have convincing power to analyze the data on gender and education. The concepts on which the theoretical framework is based have been discussed in preceding section of the current chapter. It is important to mention here that these concepts guide each chapter of

the study. As discussed in previous section and reiterate here again, gender differences in education can no more be justified on the ground of biological differences between boys and girls (Williams et al., 2009). Thus, this study is informed by social learning theories and feminist's approach to the understanding of gender and education. Social learning theory basically derives from the work of Walter Mischel and Gabriel Tarde and later on developed by Julian Rotter and Albert Bandura. They assert that individual learns in social context through reward (reinforcing appropriate behavior) and punishment (extinguishing inappropriate behavior) (Bandura & Walters, 1977). They are simply anxious with the ways children model the behavior, they see in others (Lindsey, 2015). Gender roles are learned directly through reprimands and rewards and indirectly through observation and imitation (Bandura & Walters, 1963; Mischel, 1966). It is pertinent to mention here that imitation and modeling appear to be spontaneous and not deliberately in children. Drawing on social learning theory, allows me to use the concepts of reward and punishment, observation and imitation and sex-typed behavior as these were used by Bandura and Walters Mischel. I also draw on Kate Millet's expression of the idea of omnipresent nature of patriarchy. In addition to these concepts, Simone de Beauvoir's concept of "other" has used to analyze gender and education.

Reward and punishment in this study is used in the sense as used by social learning theorists. They argued that reward and punishment are key elements of individual learning and shaping his or her role and behavior. Drawing on the work of key social learning theorists, Bandura, Walters and Mischel allows me to analyze how reward and punishment influence individual behavior and role in various spheres. This also enables me to analyze gendered academic performance. The concept of reward and

punishment are also helpful in understanding that how boys and girls performance is influenced through reward and punishment in society. Having said this, the study analyzes reward and punishment in the sense that how reward and punishment influence girls and boys academic performance. For instance, girls' performance in education has improved as because of the encouragement (reward) given to them by family and society. Hodgetts (2008) asserts that girls are getting appreciation and this appreciation work as a motivational factor for their performance in education. Drawing on the concept of punishment, I argue that the underachievement and less interest of girls in STEM education (see chapter 2, 4, and 7) have highly influenced by parents and cultural perception. Social learning theorists argue that individual do not repeat the behavior and role when they do not get appreciation from society. Drawing on this, it is argued that society and culture do not appreciate girls to work and adopt careers in STEM fields, which in turn, discourage them to come in STEM education (see chapter 7). Drawing on the concept of observation and imitation learning, it is attempted to explain how does role model influence girls' and boys' performance in education? Social learning theorists argued that individuals learn from role model around them by observing and imitating them. Using observation and imitation in this sense, led me to argue that girls are outstripping boys in arts and humanities as they see female working as teachers and doctors (see chapter 7). Boys have role model in the field of STEM such as scientists, engineers, astrophysicists, computer programmers, and so forth which in turn motivate and boost them positively in the field of STEM subjects. Thus, reward and punishment and observation and imitation are the key concepts in analyzing the data regarding boys and girls performance in education.

The girls' underperformance in STEM and outstanding performance in Arts and Humanities subjects led me to engage Kate Millet's concept of omnipresent nature of patriarchy. Kate Millett argued that the omnipresent nature of patriarchy and the ways it drew attention to the pervasiveness of patriarchy and to the ways in which it is supported through family and culture are the root causes of gender inequality in education (see theoretical review). Drawing on this, I argue that boys hegemony and dominancy in STEM fields and jobs, badly impacts and discourage girls urge to enter into STEM subjects. Patriarchal nature of culture do not allow girls to adopt careers outcome of STEM education (see chapter 7). Patriarchy and male hegemony in society are key reasons of girls' inferior and subordinate position in key positions including STEM fields in society. This is also the key element of Simone de Beauvoir's book *The Second Sex*. It is therefore, argued here that this study in the analysis of gendered performance in education draws on the core concept "Other" of Simone de Beauvoir book of *The Second Sex.*

Using the concept of "other", it is argued that boys and girls experience different roles and positions in society that affect them differently in education. As per Beauvoir's concept of "other", it is clear that girls' engagements in activities and roles inside walls and homes, impact and prevent them to join career, result of STEM fields. It is important to mention that career is important factor in opting subjects. This means that girls' underperformance in STEM subjects is linked with their passive and subordinate position, with no distinct roles in life other than that of supporting man and his ambitions.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The previous chapter presented a comprehensive literature review and theoretical framework of the study. This chapter explains the methodological procedures and steps taken for conducting this research. This study used mixed methods research (MMR) approach. The data for this study come from quantitative content analysis of results records of BISE Peshawar, KP and qualitative interviews with educationists. It is important to mention here that the decision to employ mixed methods research techniques was taken to have a deep insight and understanding of the complexity of gender differences in academic performance in the context of Peshawar, Khyber Pakhtunkhwa. For instance, quantitative content analysis technique was necessary to have a vivid picture of boys' and girls' performance in SSC and HSSC annual examinations of BISE, Peshawar, KP. The quantitative content analysis of secondary data (results record) has helped in developing good understanding of girls and boys performance in the said examinations. These initial results (see chapter 4 for detailed discussion) informed the design of the qualitative approach (thematic analysis). The content analysis made it easy to have a deep insight of the reasons, extent and nature of the gendered performance in education. The chapter begins with giving a brief account for the reasons of choosing study area, research approaches and the choice of MMR approach followed by sampling procedure, sources of data, data collection process, data analysis and ethical considerations.

3.2 The Universe of the Study

The study was carried out in the province of Khyber Pakhtunkhwa. KP is one of the four provinces of Pakistan situated in northwestern region of the country along the international boarder of Afghanistan. KP covers an area of 74,521 sq. km. It is one of the most important strategically located provinces (Mustafa, 2012). It was previously known as the North West Frontier Province (NWFP). KP is divided into four geographical region: a) the Southern Zone b) the Central Zone, c) the North-Western Malakand region and d) the North-Eastern Hazara Region. The province consists of 26 districts. According to Census 2017, the total population of province is 30523371 with urban population 6729634 and rural 24793737. The gender division of population shows (15467645 male and 15054813 female)

The specific focus of the study was on the Board of Intermediate and Secondary Education (BISE) Peshawar KP. It is important to highlight that there are a total of 8 Education Boards in Khyber Pakhtunkhwa. These Boards are named as: Board of Intermediate and Secondary Education, Peshawar, Board of Intermediate and Secondary Education, Mardan, Board of Intermediate and Secondary Education, Abbottabad, Board of Intermediate and Secondary Education, Bannu, Board of Intermediate and Secondary Education, Swat, Board of Intermediate and Secondary Education, Kohat, Board of Intermediate and Secondary Education, Malakand and Board of Intermediate and Secondary Education, Dera Ismail Khan. I selected the Board of Intermediate and Secondary Education (BISE) Peshawar. The key reasons for choosing the aforementioned Board were: (a) the gender reversal change has been observed only in the urban centers of Khyber Pakhtunkhwa; (b) it was one of the largest and oldest

educational boards of Khyber Pakhtunkhwa, located in the province capital city and (c) last but not the least, many urban schools and colleges of the province are affiliated with it.

3.3 Research Approaches and the Choice of Mixed Methods Approach

The researcher faces confusion and difficulty at the beginning of research in choosing and setting a viable approach of research methods. The type of research approach, the researcher uses is often determined by the research philosophy, objectives and questions. For instance, Kothari (2004) asserts that research method is good if it explains the research questions and objectives well. There are commonly three broad categories of research methodology: quantitative, qualitative and mixed methodology. The first two approaches are using since long time, however, mixed methods research has been practiced since 1950s. Nonetheless, MMR became a popular approach in 1980s for many researchers especially in the field of education (Creswell & Clark, 2017; Creswell & Creswell, 2017; Dunning et al., 2008). These broader categories are further divided into sub types. Quantitative research focuses on objective theories by examining relationship between variables (Creswell & Clark, 2017). They further assert that quantitative research aims to count and measures things. It is important to mention here that the positivist research paradigm underpins quantitative methodology. The realist/objectivist ontology and empiricist epistemology in the positivist paradigm needs a research methodology that is objective, where the focus is on measuring variables and testing hypotheses (Marczyk et al., 2005; Tuli, 2010). Similarly, positivist research uses experimental designs to measure effects, especially through group changes. The data collection techniques focus on gathering hard data in the form of numbers to enable

evidence to be presented in quantitative form (Tuli, 2010). Methodologically, truth in positivist inquiry is achieved through the verification of observable findings (Lundahl et al., 2010) 2005) and the application of statistical analysis (Bryman, 1984). Positivists, therefore, emphasize the use of valid and reliable methods in order to describe and explain the events.

In contrast, qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things (Tuli, 2010). Qualitative methodology is supported by interpretive epistemology and constructionist ontology. This assumes that meaning is embedded in the participants' experiences and this meaning is mediated through the researcher's own perceptions through observation, interaction and making himself or herself familiar with respondents' culture. For instance, researchers using qualitative methodology to immerse themselves in a culture by observing its people and their interactions, often participating in activities, interviewing key people, taking life histories, constructing case studies, and analyzing existing documents or other cultural artifacts. The qualitative researcher's goal is to attain an insider's view of the group under study. It is important to argue here that methodologically; constructivists and interpretive do not believe in experimental or quasi-experimental research designs. Constructivists assume that reality is multifaceted and cannot be fragmented or studied in a laboratory, rather it can only be studied as a unified whole within its natural context (Antwi & Hamza, 2015).

Mixed method research (MMR) refers to a strategy for a scientifically careful research process comprised of both qualitative and quantitative core component that directs the theoretical drive, with qualitative or quantitative supplementary components.

These components of the research fit together to enhance description, understanding and can either be conducted simultaneously or sequentially (R. B. Johnson et al., 2007). Mixed method research approach gains a deep understanding of the issue in hand. For instance, Tuli (2010) asserted that mixed method research approach can lead to a more complete, contextual portrait and bigger picture of the problem under study. For instance the values of methodological marriages are important because the weakness of one approach may be balanced against the strengths of another style. I used mixed method research approach because a single approach could not answer some of the objectives and questions of the study. This is in line with what Kothari (2004) mentioned in his book *Research methodology: Methods and techniques* that research objectives and questions need to be considered while choosing a particular research method.

Keeping the limitations of each approach and looking at objectives and questions of the study, I carried out mixed method research approach. For example, quantitative content analysis technique was necessary to get a vivid picture of girls' and boys' performance in SSC and HSSC annual examinations of BISE, Peshawar, KP. By doing quantitative content analysis of secondary data, a clear picture of girls' and boys' performance was drawn. These early results (see chapter 4 for detailed discussion) informed the design of the qualitative approach to present a deep and holistic insight of the factors of differential performance of boys and girls.

3.4 Sampling and Sample Size

Purposive and convenience sampling technique was employed for selecting different units of data collection. Purposive sampling is a type of non-probability sampling in which one selects the units to be observed on the basis of one own judgment

about which ones will be the most representative (Kothari, 2004). Purposive sampling is dominantly a feature of qualitative research or non-probability sampling, in which researchers handpick the cases included in the sample (Cohen et al., 2013). As the name suggests, the sample has been chosen for a specific purpose. In many cases, purposive sampling is carried out to access people who have in-depth knowledge of the issue, may be by virtue of professional role, power, and access to networks expertise or experience (Ball, 1997). Convenience sampling is a non-probability sampling procedure where units are selected due to their easy accessibility. Convenience sampling can be used in quantitative and qualitative study (Suen et al., 2014). Unlike purposive sampling, convenience sampling is preferred when the data possess quantitative feature (Etikan et al., 2016). As this study has different units of data collection i.e. both quantitative (results records) and qualitative data (interviews), therefore, the study employed both purposive and convenience sampling methods. The purposive sampling technique is used for selecting study's respondents to collect primary data and convenience sampling technique for selecting secondary data (results record).

3.5 Sample Category of Respondents

A total of 30 respondents were selected as a sample size for this study through purposive sampling technique. The respondents are school and college teachers, principals, and chairman board and secretary education. Two School principals (01 male and 01 female) and two College Principals (01 against each gender) were included in sample size. Likewise, the paper checkers were selected according to subjects, i.e., Compulsory, Science and Arts/ Humanities. In the category of compulsory subjects, two paper checkers (01 male and 01 female) while for the subjects of Science and

Arts/Humanities two paper checkers were chosen in the sample size (01 against each gender). Similarly, Chairman Board of Intermediate and Secondary Education BISE Peshawar was interviewed for knowing his experiences regarding gender differences in academic performance. The reason behind selecting him as my study's respondents was to get an insider understanding of the reasons of boys' and girls' performance in education in KP. Initially, I was supposed to interview secretary education KP but later on, he was not interviewed due to his busy schedule. As noted earlier in qualitative study respondents are involved in study sample size with the assumption that they have in-depth knowledge of the issue, by virtue of professional role, power, and access to networks expertise or experience (Ball, 1997). The distribution of the sample size has given in table 3.1

Table 3.1

Sample Distribution

S. No	Sample Distribution																					
01.	Chairman Board of Intermediate and Secondary Education Peshawar (01)													Provisional Secretary Education Department Khyber Pakhtunkhwa (01)								
														Male							Female	
02.	School Principals													01							01	
03.	College Principals													01							01	
04.	Paper Checkers																					
	Compulsory Subjects						Science Group							Arts/Humanities Group								
05.	Urdu		English		Pakistan Studies		Islamic Studies		Physics		Biology		Chemistry		Math		History		Civics		Home Economics		English and literature
	2		2		2		2		2		2		2		2		2		2		2	
Total Sample Size	30																					

3.6 Choice of Selecting Results and Sample of Results Records

As noted earlier that results record is the main sources of secondary data for this study. It is important to mention here that researcher selects data sets that are consistent with the research questions and objectives. The other reason for selecting results records was to find out the nature and trend of the issue which will be accurately explored later on with the help of primary data. Research usually begins with the inquiry that what is already known about the topic and what remains to be dig out (Creswell & Creswell, 2017). These results books and records clearly show the performance of boys and girls in SSC and HSSC examinations of BISE, Peshawar, KP. This was very much important for exploring the reasons of gendered performance across various subjects.

I collected all the results records published in the years from 2002 and 2016. I employed convenience sampling for selecting the results records. The convenience sampling is used as it was the best sampling technique in such circumstance. Riff et al (2019) explain that convenience sampling technique is appropriate option in three cases, two of which is applied to this study: a) the condition of limited resources (time and money) b) Easy access to the results records being studied. The overall sampling procedure of the results records is given in the following figure 3.1.

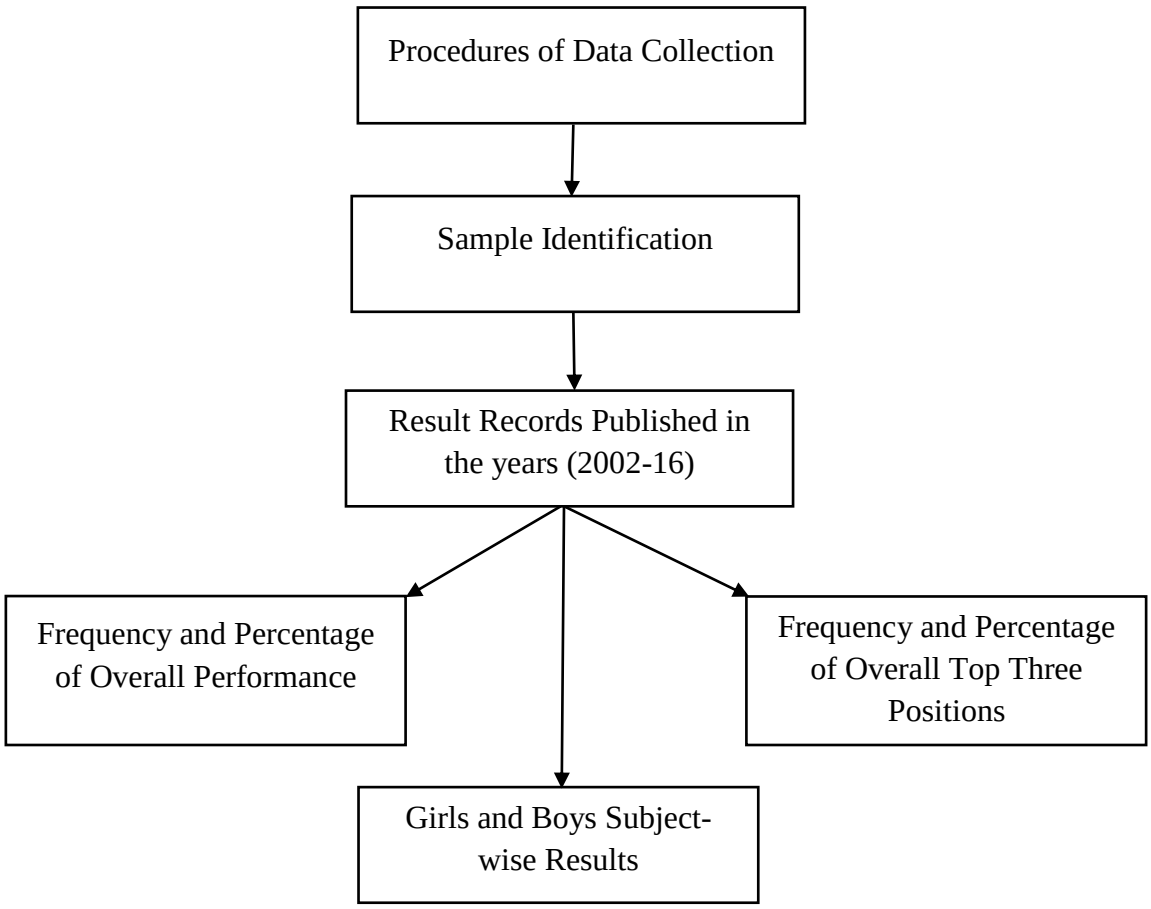

Figure-3.1 ***Sampling Procedure of Results Records***

3.7 Quantitative Content Analysis of Results Records

As mentioned earlier and recap here again that this study employs mixed methods approach. The results books published in the year from 2002 and 2016 of BISE, Peshawar, KP have been analyzed in line with quantitative content analysis technique. Content analysis is a method of data collection as well as mode of analysis (H. Ullah, 2018). As a method of social research, content analysis is a documentary method that focuses on a quantitative and qualitative analysis of the texts, picture, films and other forms of verbal, visual or written documents (Flick, 2014). Moreover, as a quantitative

method, it is employed when the focus is on determining the time and frequency of an event. The study employed quantitative content analysis to examine the results records. The reasons for doing content analysis of the results records were: first, to know the current trends of girls' and boys' performance in education; second, to portray a vivid picture of girls' and boys' performance in various subjects. This has done with the help of categories (see table 3.2). Category is an important feature of content analysis (Graneheim & Lundman, 2004). Thus, in content analysis, construction and developing of category is very important. A category is a set of criteria that are integrated around a theme or value. Flick (2014) cited in Ullah (2018: 32) argued:

> One essential feature of content analysis is categories, which are often derived from theoretical models: categories are brought to the empirical material and not necessarily developed from it, although they are repeatedly assessed against it and modified if necessary.

Drawing on the insight from Flick, following categories were developed for evaluating boys' and girls' performance in SSC and HSSC examinations.

Table 3.2

Content categories against which the result records (2002-2016) have been evaluated.

Categories List of Examining Girls and Boys Results
• Girls and Boys Performance/Passing Percentage in SSC Examinations
• Girls and Boys Performance/ Passing Percentage in HSSC Examinations
• Overall Top Three Positions Holders in SSC
• Overall Top Three Positions Holders in HSSC Examinations
• Boys and Girls Subject-wise performance

The quantitative content analysis in this research has been carried out with the following plan.

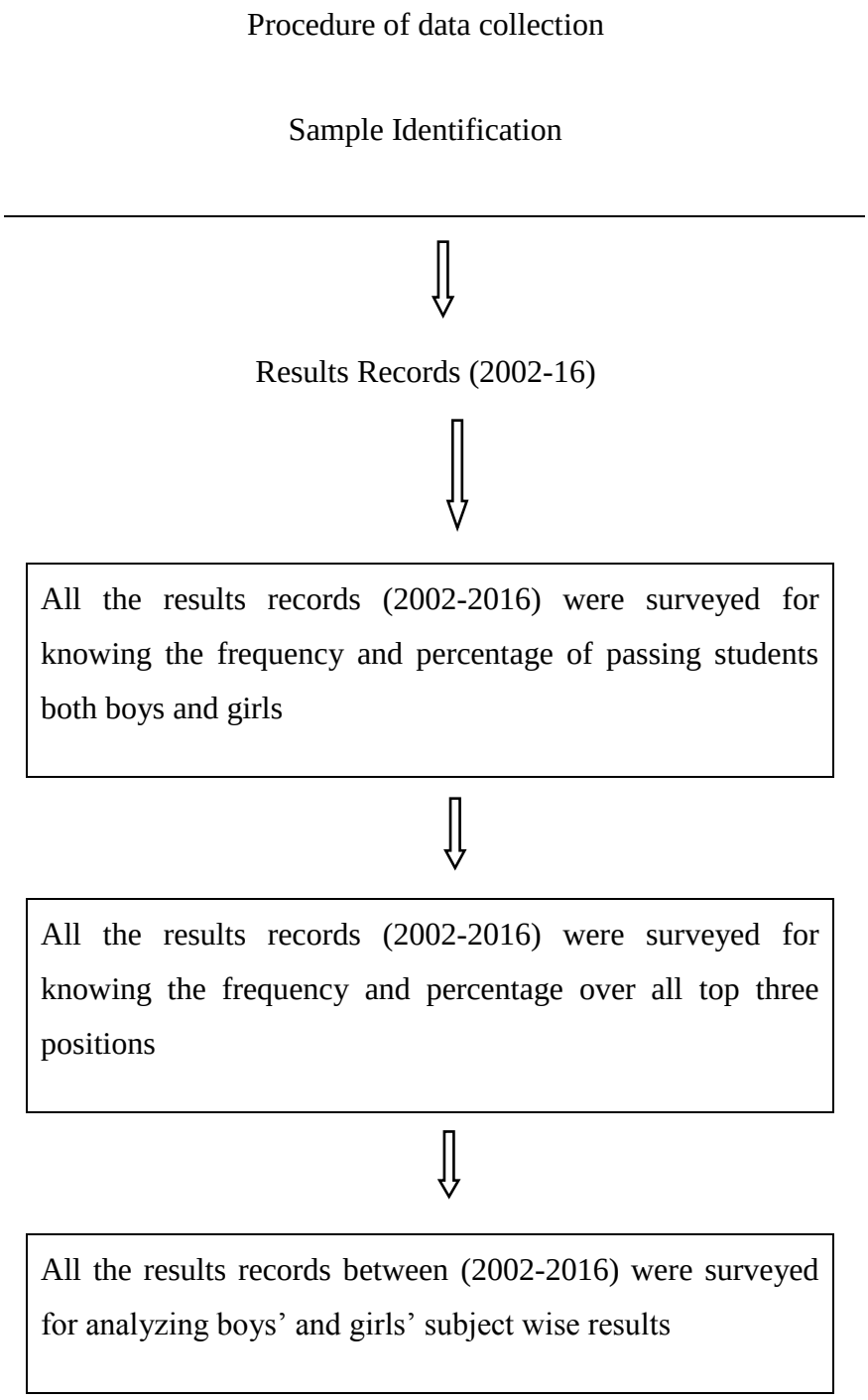

Figure-3.2 ***Sample Identification in Content Analysis***

3.8 Interview with the Study's Respondents

After collecting and gathering secondary data, in-depth interviews used (see appendix iii) as a method for the collection of primary data. I conducted interviews with school and college papers checkers, principals, Chairman Board of BISE Peshawar. The interviews of both males and females having the knowledge and information of boys' and girls' performance in education were taken. Similarly, in order to have holistic picture of the trend, causes and factors of boys' underperformance, girls' outperformance and the gap in the performance of STEM subjects, it was necessary to interview both male and female teachers. I took help of my friend who is serving as a subject specialist in one of the schools located in Peshawar to get access to male respondents. For female respondents, I approached a female principal who was known to me. She helped me in accessing and fixing time with female respondents. All interviews were carried out in face to face conversation in the office of study's respondents. Interviews took as long as necessary, usually 35 minutes to 50, to build rapport with respondents. This helps me to get rich information that unpacked the underlying reasons of gendered performance in SSC and HSSC annual examination of BISE, Peshawar, KP. All interviews were included in the present analysis. The interviews offered enough data to reach “saturation” a point where consistent themes and reliable conclusions were made of boys' and girls' performance across various subjects.

3.9 Validity of Research Instrument

Validity is a measure of the degree to which data is collected using a particular instrument indicated a particular area of indicator (Mugenda & Mugenda, 1999). The tool was pilot tested on two school and two college teachers before the actual data collection.

The purpose of this pilot testing was to check whether the tool measures the required information or not. This pilot testing helped me to make correction in the ambiguous questions before collecting the data.

3.10 Reliability of Research Instrument

According to Mugenda and Mugenda (1999) reliability is an amount of the degree to which a research instrument yields constant results after frequent trials. They further opined that test-re-test enables the researcher to receive important feedback on how questions can be reviewed to be more effective and relevant. The test-re-test is done to people who have some similarities to those who will actually be covered in the actual study.

3.11 Data Analysis of Primary and Secondary Data

Data analysis was continues process from data collection till the analysis of the transcribed data. There was initial analysis that took place during interviews with respondents. The preliminary analysis of the interviews has given a clear picture of the most important aspects of the data. After this rigorous initial analysis of interviews, the data were analyzed trough qualitative research technique. While doing qualitative thematic analysis, I have followed all the procedures and phases of thematic analysis technique. The analysis has been carried out with the following procedures.

I repeatedly read and transcribed the data to become familiar with all the aspects of data, after familiarizing myself with data and transcribing it, I coded my data. The codes were analyzed through careful reading and rereading to remove redundant or overlapping codes. The codes have been assigned broader themes. With a thorough review of the broader themes, I came up with more specific and focused themes.

Similarly, each theme is defined and named to know that what each theme is all about. To ensure the validity of the data collection and analysis, triangulation is used with the themes identified in literature review. Thus, the developing of themes has been underpinned both by the data and literature review. Each theme has been reflected by the relevant data from the field and discussed and debated with the help of theoretical and philosophical reviews skimmed for this study**.** Similarly, the results books of SSC and HSSC examinations published in the year from 2002-2016 have been analyzed in line with quantitative content analysis technique.

3.12 Ethical Consideration

Prior to embarking on the study, after being allowed by the supervisor to collect the data, I sought permission from the concerned authorities. The interview guide was approved by the supervisor before being used in this research. I informed the study respondents about the purpose of the study. Furthermore, the privacy of the respondents was considered in the process of data collection during answering in interview sessions. I assured them that this information will be kept confidential and will be used for academic purpose.

CHAPTER FOUR

GENDERED ACADEMIC PERFORMANCE: QUANTITATIVE CONTENT ANALYSIS OF RESULTS RECORDS

4.1 Introduction

As discussed in chapter 2 of this thesis, that the discourse of boys' underperformance and girls' outperformance has got momentum in both developed and developing countries (Adler et al., 1992; Whitney & Smith, 1993; Wirt et al., 2000). It is also debated in review of literature that despite of girls' outstanding performance in education, there are studies that still document girls' underperformance in STEM subjects (see review of literature). This issue of boys' underperformance and girls' outperformance and their subject wise performance, although very significant in Pakistani urban context, have not received due academic attention. Keeping this in view, this chapter focuses on the issue of gendered academic performance of boys and girls in SSC and HSSC examinations (2002-2016) held under BISE Peshawar, KP. The result records analyzed to draw a clear picture of the overall trend of gender based performance in the cited examinations. It is worth considering to argue that when lacking empirical studies on gendered academic performance, results records are important sources of getting clear picture of boys' and girls' performance in education. The chapter attempted to present a detailed quantitative content analysis of results records of the mentioned examinations. The results records have been evaluated against categories derived from empirical and theoretical review (see table 3.2 in chapter 3 for detailed discussion). The chapter concludes with the assertion that girls outperform boys in Secondary School Certificate and Higher Secondary School Certificate examination held under BISE Peshawar. The

findings of the chapter also found that girls unlike arts and humanities, underperforming in science subjects.

4.2 Boys' and Girls' Passing Percentage in SSC Examinations BISE Peshawar

The analysis of this study reveals that the overall passing percentage of girls in SSC examination is higher for girls than boys. The data show greater level of prevalence and sameness to studies conducted in different societies. However, as the socio-cultural context of each society is different (see literature review), therefore, the data show continuous but unlike other society, a steady and slowly increase in the gap between boys' and girls' performance in the SSC annual examinations. Table 4.1 gives a vivid picture of girls' outperformance in the examinations at school levels.

Table 4.1

Boys' and Girls' Passing Percentage in SSC Examinations

Year	Gender				Total
	Boys		Girls		
	Appeared *f* (%)	Passed *f* (%)	Appeared *f* (%)	Passed *f* (%)	Appeared *f* (%)
2002	74677 (75.4)	29053 (38.9)	24412 (24.6)	13202 (54.1)	99089 (100%)
2003	57736 (72.6)	28839 (49.9)	21785 (27.4)	15006 (68.9)	79521(100)
2004	55254 (70.7)	24261 (43.9)	22684 (29.3)	11794 (52%)	77938 (100)
2005	57286 (69.0)	29188 (50.9)	25709 (31)	15213 (59.1)	82995 (100)
2006	29407 (70.9)	15599 (53)	12041 (29.1)	7045 (58.5)	41448 (100)
2007	38245 (73.0)	21887 (57.2)	14154 (27.0)	9261 (65.4)	52399 (100)
2008	72526 (70.2)	41425 (57.1)	30795 (29.8)	20225 (65.7)	103321 (100)
2009	71261(69.3)	45688 (64.1)	31614 (30.7)	23694 (74.9)	102875 (100)
2010	79056 (70.7)	53195 (67.3)	32763 (29.3)	25241 (77.0)	111819 (100)
2011	84529 (70.9)	54658 (64.7)	34705 (29.1)	25680 (74.0)	119234 (100)
2012	87506 (70.7)	61909 (70.7)	36206 (29.3)	29024 (80.2)	123712 (1000
2013	91709 (70.9)	69036 (75.3)	37622 (29.1)	30267 (80.4)	129331 (100)
2014	96484 (70.8)	67424 (69.9)	39857 (29.2)	30570 (76.7)	136341 (100)
2015	97976 (70.2)	65839 (67.2)	41520 (29.8)	31770 (76.5)	139496 (100)
2016	101048 (69.5)	64883 (64.2)	44286 (30.5)	33232 (75.0)	145334 (100)
Total	1094700	672884	450153	321224	1544853

Source: BISE Peshawar

Table 4.1 depicts the passing percentage of boys and girls in Secondary School Certificate Examinations of the year 2002-2016. In the year 2002, a total of 74677 boys appeared in the SSC examination. Only 29053 boys passed the examination. The passing percentage of boys was 38.9. In the same year, a total of 24412 girls appeared in the SSC examination, 13202 girls successfully qualified the exam and outshined boys by attaining 54.1 pass percentage rate. Similarly, the statistics of the year 2003 also depict high success rate for girls. In the year 2004, 55254 boys appeared in examination of 9^{th} and 10^{th}, out of which 24261, were declared successful with a passing percentage of 43.9 which is less than the female students' passing percentage 52%. The exam result of the year 2005 shows the outperformance of girl students. The passing percentage of girl students was 59.1 percent girls whereas only 50.9% boys passed the examination. Similarly, the passing rate of girls is 58.5 percent while that of the boys is 53 for the examination conducted in the year 2006. The girls' accomplishment percentage rate is 58.5 whereas the boys are 53 in examination held in 2006. In the examination taken in the year 2007, the success rate of the girl students was 65.4 percent while that of the boy students was 57.2 percent. The result of the year 2008 reveals that girls have shown good results as compared to boys. Similarly, the result of the examination held in the year 2008 presents that passing percentage ratio of girl students is 65.7 percent whereas the passing percentage of boy students is 57.1. The success rate of girl students is 74.9 percent where that of boys is 64.1 in the examination conducted in the year 2009.The results further represent a significance difference of girls and boys success in examination held in 2010. 77 percent girls qualified their exams successfully and boy' success ratio was 67.3 percent. The statistics of the examination for the year 2011 indicate that 74 percent girls

have passed their exam while only 64.7 percent boys passed the exam. Similarly, in the year 2012, the passing ratio of girl students was 80.2 percent while that of the boy students was 70.7 percent. The statistics of the 2013 year show that 80.4 percent girls and 75.3 percent boys qualified their SSC exam successfully. The data in the table further show that girls have done well in the examination conducted in the year 2014. The statistics of 2014 reveal that the qualifying ratio of the girl students is 76.5 percent whereas boys passing ratio is 69.9 percent in the same exam. Similarly, the result of the examination held in the year 2015 and 2016 also shows outstanding performance of girl students. The data in the table clearly revealed that the performance of girls with each passing years has increased. The findings of this study are in line with studies conducted in other societies. For instance, McDowell found that girls outperform boys and have maintained high passing percentage. Marks (2008) revealed that girls are continuously outscoring boys and securing high passing percentage rate than boys in the secondary school certificate examinations. Girls' performance with each passing year is improving(Mead, 2006). In a nutshell, it can be asserted that the study's findings buttress to the studies conducted by(Marks, 2008; McDowell & Ray, 2000).

4.3 Boys' and Girls' Passing Percentage in HSSC Examinations BISE Peshawar

The study findings further reveal that that the outperformance of girls is not only confined to school but also happening at college level. The same gender reversal change in education favoring girl students has also been observed at College level. Table 4.2 gives a clear picture of the girls' outstanding performance in examinations at college level.

Table 4.2

Boys' and Girls' Passing Percentage in HSSC Examinations

Year	Gender				Total
	Boys		Girls		
	Appeared *f* (%)	Passed *f* (%)	Appeared *f* (%)	Passed *f* (%)	Appeared *f* (%)
2002	26400 (68.7)	11160 (42.3)	12007 (31.3)	5325 (44.3)	38407 (100%)
2003	26779 (66.2)	12874 (48.1)	13699 (33.8)	7481 (54.6)	40478 (100%)
2004	30461(66.1)	13374 (43.9)	15645 (33.9)	7859 (50.2)	46106 (100%)
2005	32740 (66.6)	16725 (51.1)	16427 (33.4)	9441 (57.5)	49167 (100%)
2006	35591 (66.2)	19627 (55.1)	18197 (33.8)	11846 (65.1)	53788 (100%)
2007	36125 (66.4)	21665 (59.9)	18309 (33.6)	12382 (67.6)	54434 (100%)
2008	40424 (68.3)	26641 (65.9)	18779 (31.7)	13143 (69.9)	59203 (100%)
2009	45764 (67.8)	29102 (63.6)	21729 (32.2)	15929 (73.3)	67493 (100%)
2010	49138 (66.7)	31290 (63.7)	24565 (33.3)	17928 (72.9)	73703 (100%)
2011	52726 (67.0)	35933 (68.1)	25923 (33.0)	19329 (74.6)	78649 (100%)
2012	58407 (68.5)	38911 (66.6)	26792 (31.5)	19894 (74.2)	85199 (100%)
2013	62755 (69.3)	42795 (68.2)	27814 (30.7)	21802 (78.4)	90569 (100%)
2014	65565 (69.7)	42355 (64.6)	28522 (30.3)	22498 (78.9)	94087 (100%)
2015	67846 (70.6)	40394 (59.5)	28257 (29.4)	21728 (76.9)	96103 (100%)
2016	68878 (70.6)	44158 (64.1)	28672 (29.4)	22520 (78.5)	97550 (100%)
Total	699,599	427,004	325,337	229,105	1,024936

Source: BISE Peshawar

Table 4.2 represents the passing percentage of boys and girls in the HSSS annual examinations conducted in 2002 -2016. The data reveal that in the year 2002, a total of 26400 boys appeared in the HSSC (1st year & 2nd year) examinations. Only 11160 boys passed the examination and their passing percentage was 42.3. In the same year, a total of

12007 girls appeared. 5325 girls qualified the exam and outclassed boys by attaining 44.3 passing percentage rate. The result of the year 2003 and 2004 reveals remarkable success rate for girls. 32740 boys appeared in examinations held in the year 2005, out of which 16725 qualified their exam with a passing percentage 51.1 which is less than the girls' passing percentage (57.5). In the examination held in the year 2006, girls 'outperformed boys and secured 65.1 passing percentage. In the similar year, the passing percentage for boys was noted as 55.1 .The success rates of girls was 67.6 percent where as that of the boys was 59.9 percent in the examinations conducted in the year 2007. The results of the exam held in the year 2008 show the excellent performance of girls. Girls outshined boys in the examination taken in the year 2009 by attaining 73.3 passing percentage where boys passing percentage rate was 63.6. Girls continued their good performance in the examination held in the year 2010 where 72.9 percent girls passed their exam while only 63.7 percent boys qualified their exam. The statistics indicate that 74.6 percent girls have passed their examination while passing percentage of the boys was 68.1 percent in the examination held in the year 2011. This represents good performance of girl students. Likewise, in the year 2012, the passing ratio of girl students was 74.2 while that of the boy students was 66.6 percent. The data in the mentioned table reveal that girl students have performed well in the examination taken in the year 2013. The statistics of the same year show that 78.4 percent of the girl students have passed their exams while passing ratio of the boy students is 68.2 percent. Similarly, the data in the table further show that girls have done well in the examinations taken in the year 2014. As the statistics of the said year reveal that, the qualifying ratio of the girls' students is 78.9 percent while the boys' passing ratio in the same year is 64.6 percent. Similarly, the results of the

examination held in the year 2015 and 2016 show good performance of the girls' student. It is considered to assert here that the data clearly show consistent improvement in the performance of girls in HSSC annual examinations. It can be clearly seen from the table that the performance gap is increasing with each passing year. These findings are similar to the findings of studies carried out in other countries. For example, similar research carried out in 1990s, revealed that girl outshine boys in higher secondary education in United Kingdom (Gorard et al., 1999). Mike Younger and Warrington (2007) also found that girls in the last one and half decade outperform boys in higher secondary annual examinations.

4.4 Overall Top Three Positions Holders in SSC and HSSC Examinations

The results of content analysis reveal that the percentage of the overall top three positions is higher for girl students in both SSC and HSSC examinations. Table 4.3 depicts a complete picture of the overall top three positions holder for the period 2002-2016.

Table 4.3

The percentage of Contents of Overall Top Three Positions in the SSC and HSSC Examinations

Year	SSC				HSSC			
	Position			Out Performed	Position			Out Performed
	1st	2nd	3nd		1st	2nd	3nd	
2002	Girl	Boy	Boy	Boy	Girl	Boy	Girl	Girl
2003	Girl	Girl	Girl	Girl	Boy	Girl	Boy	Boy
2004	Girl	Girl	Girl	Girl	Girl	Girl	Boy	Girl
2005	Boy	Girl	Boy	Boy	Girl	Girl/Boy	Girl	Girl
2006	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2007	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2008	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy
2009	Girl	Boy	Girl	Girl	Girl	Girl	Girl	Girl
2010	Boy	Girl	Girl	Girl	Girl	Girl/Boy	Boy	Boy
2011	Girl	Girl	Girl	Girl	Girl	Girl/Boy	Girl	Girl
2012	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2013	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2014	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2015	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl
2016	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
Out Performed: Girls=77.8%, Boys=22.2%					Out Performed: Girls=77.1%, Boys=22.9%			

Source: BISE Peshawar

Table 4.3 reveals data regarding the overall top three positions holders of the SSC and HSSC examinations for the year 2002-2016. In the SSC examination held in the year 2002, the first position was secured by girl while the second and third position by boy. Girls outshined boys in the examination conducted in the year 2003 and 2004 by grabbing all the top three positions. However, in examination 2005; boys outperformed girls and bagged the 1st and 3rd positions. The examinations held in the year 2006, 2007 and 2008 were totally dominated by girls and clinched all the top three positions. Girls outshined boys in the examination conducted in 2009 by clenching 1st and 3rd positions. Similarly, girls did well in the examination held in the year 2010 by securing 2nd and 3rd positions. The result of the year 2011, 2012 and 2013 shows outstanding performance of

girls. Girls whitewashed boys and achieved all top three positions in the examinations held in the mentioned years. The girls repeated the similar performance in the examination held in the year 2014 where they got 2nd and 3rd position while in the year 2015, boys dominated girls by securing all the three positions. In the examination, held in the year 2016, girls outclassed boys by achieving all top positions.

Table also shows the overall top three positions holder in the HSSC examinations of the year 2002-2016. The examination conducted in the year 2002 dominated by girls and secured 1st and 3rd positions. However, the similar performance is shown by boys in the year 2003 where they got 1st and 3rd positions. Girls outperformed boys in the examinations held in the year 2004, 2005, 2006 and 2007 by clenching all the positions. Conversely, in HSSC examination 2008; boys outperformed girls and bagged all the three positions. Similarly, the result statistics from the year 2009 to 2016 reveal outperformance of girls and grabbed all the first three positions in the HSSC examinations of the above mentioned years.

The data presented in the table show greater similarities with the findings of the studies conducted in different societies. For example, the similar findings have been found in empirical studies carried out in later 1990s. As highlighted by Steele (1997) that in the last two decades, a significant disparity in gender performance especially at school and college level has seen. He asserted that girls are clenching top positions and their passing percentage is significantly higher than boys. McDonald et al., (2011)'s study found that girls are outstripping boys in secondary and higher secondary level in terms of grades and results. They concluded their findings with the assertion that girls clenching top positions not only at school but also at college level in nearly all subjects. Comparing

the findings of the studies conducted by McDonald et al., (2011) and Steele, (1997) to the results of the data depicted in the table 4.3, it is stated that the trend of girls' outperformance in Peshawar, KP, is similar in many ways to that of the other societies. For example, girls in early 2000s, started to outperform boys in terms of clenching top positions with slight margin. However, with each proceeding year, the data shows jump in the performance of girls and in grabbing all top three positions. To conclude the findings, it is asserted that the outperformance of girls is increasing with the passage of time in Peshawar, KP in both secondary and higher secondary education.

4.5 Boys' and Girls' Subject-wise Performance

As noted in the literature review of this study that the gender gap favoring girls has been witnessed in education across the globe. Boys have historically dominated girls particularly in STEM subjects across the globe with the exception of few developed countries (Alexander, 2010). There are increasing evidences that boys outperform girls in science (Baker & Jones, 1993; Cole, 1997; Hedges & Nowell, 1995; Yerdelen-Damar & Peşman, 2013). Findings of a recent study researched by Ganley et al., (2014) revealed that boys outshining girls in math, physics and chemistry and girls dominate boys in arts. Burke & Mattis (2007) assert that the underrepresentation of boys in humanities and girls in the subjects of science is a world-wide phenomenon. The study's analysis also demonstrates subject-wise performance of girls and boys. Table 4.4 presents a complete picture of boys' and girls' performance across different disciplines in the HSSC annual examinations.

Table 4.4

Boy and Girls Subject Wise Performance in in HSSC Examinations

Year	Category: Pre-Medical Group				Category: Pre-Engineering Group				Category: Humanities Group				Category: General Science			
	1st	2nd	3rd	Overall Outperform	1nd	2rd	3rd	Overall Outperform	1st	2nd	3rd	Overall Outperform	1nd	2rd	3rd	Overall Outperform
2002	Girl	Boy	Girl	Girl	Girl	Girls	Boys	Girls	Girl	Girl	Girl	Girl	Boy	Boy	Girl	Boy
2003	Boy	Girl	Girl	Boy	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Boy	Girl	Girl	Girl
2004	Girl	Boy	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Boy	Girl
2005	Girl	Girl	Boy	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy
2006	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2007	Girl	Girl	Girl	Girl	Boy	Girl	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Boy	Girl
2008	Boy	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Boy	Boy	Girl	Boy
2009	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2010	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Boy	Girl	Boy	Boy
2011	Girl	Girl	Boy	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Boy	Girl	Girl
2012	Girl	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2013	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Boy	Girl	Girl	Girl	Boy	Boy
2014	Girl	Girl	Boy	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
2015	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Boy	Boy	Girl	Boy
2016	Girl	Girl	Girl	Girl	Boy	Boy	Boy	Boy	Girl	Girl	Girl	Girl	Girl	Girl	Girl	Girl
	Out Performed: Girls=84.4%, Boys=15.6%				Out Performed: Girls=8.9%, Boys=91.1%				Out Performed: Girls=93.3%, Boys=6.7%				Out Performed: Girls=64..4%, Boys=35.6%			

Source: BISE Peshawar

Table 4.4 represents the subject-wise performance of boys and girls in HSSC examination from 2002-2016. In the examination held in the year 2002, girls and boys have shown different performance in the subjects of pre-medical, pre-engineering and humanities group. Girls have outperformed boys in the group of pre-medical and humanities but they underperformed in the group of pre-engineering. Similarly, the mentioned table shows that girls are significantly outperforming boys in terms securing positions in pre-medical and humanities. The results records show huge gap in the overall positions in the group of pre-medical where the percentage of girls in the first three positions are: (Girls=84.4%, Boys=15.6%) from 2002-2016. Similarly, in the group of humanities, girls are outstripping boys in terms of positions in the examinations (2002-2016). Girls have clenched 42 out of 45 position and boys have secured only 3 positions. The overall percentage of girls' positions in the humanities is 93.3% whereas the percentage of boys' positions is 6.7. In the group of general science, the results records go in the favor of girls where the overall percentage of their positions is 64.4 and the percentage of boys' positions is 35.6. This means that girls have dominated boys with huge margin in the subjects which are traditionally considered as feminine subjects. However, the point to be noted here is that despite of this tremendous performance of girls, they are underperforming in the category of pre-engineering. The data in the table show that there are total 45 positions i.e. 1^{st}, 2^{nd} and 3^{rd} in the category of pre-engineering from 2002-2016. Boys have whitewashed girls in terms of achieving positions. The data illustrate that 41 out of 45 positions belong to boys while only 4 positions are secured by girls. The overall percentage of boys' top three positions is 91.1 and girls' percentage of the top positions is only 8.9.

The findings, thus confirms girls' outstanding performance in the HSSC examinations and they have dominated boys with the exception of science related subjects. The findings are in line with the empirical studies conducted in early 2000s. For example, Liew and Pong, (2005) assert that girls are doing well and outshine boys in examinations. They further argued that despite of gender reversal change in education, boys still dominate girls in the subjects fall in the category of pre-engineering. Cheryan et al., (2017 and E. Smith (2011) found in their study on the *subject wise performance of boys and girls* that girls are outshining boys in pre-medical and humanities with huge margin and this gap has been increased over time but their performance is weak and shaky in science, technology, engineering and math subjects. My assertion to be noted here is that girls despite of good performance in education are not catching up boys in science subjects.

4.6 Conclusion

The chapter explored that girls outshined boys in the SSC and HSSC examination held in the year between 2002- 2016 under the Board of Intermediate and Secondary Education, Peshawar, KP. The findings of the chapter revealed that the passing percentage of girls in the SSC annual examination between 2002 and 2017 is higher than boys. It is important to highlight that over the year, this percentage increased. The findings of the chapter also shed light on the boys' and girls' performance in HSSC examination held under BISE Peshawar. The findings presented a clear picture of gendered performance in the said examinations. It is argued that girls' performance with each year has been improved. The gender reversal gap in educational institution has widened since for the last few years. Girls are outperforming boys with huge margin in

results at school and college levels' examinations. Allen et al. (1992) spotlighted that female students are doing well in examinations at school and college levels for the last one and half decade.

The study also found the gender gap in STEM subjects. The study findings revealed that girls unlike other subjects of general group and arts and humanities, are struggling in STEM education. It is pertinent to mention here that overall, their performance has been improved but boys are still ahead in STEM education. Many research have revealed that boys have outclassed girls in the (STEM) subjects (Fennema, 2000; Kaiser et al., 2014; Muthukrishna & Kwela, 2010). It is important to assert that in some societies, girls are doing well in STEM subjects and the gap is closing (see chapter 2 for detailed discussion). For example, Hyde & Mertz (2009) assert that girls have achieved parity with boys in STEM subjects, both at school and college levels in developed countries. Despite of good performance of girls in SSC and HSSC examination in Peshawar, KP, the performance of girls is not satisfactory in STEM subjects. In female dominated subjects such pre-medical and humanities, girls' outstripped boys with large margin. However, in boys dominated subjects, such as science, there is still a large gap in the favor of boys. The key concern then is that why do girls underperform in STEM education and why do boys fail in art and humanities? As noted earlier that in context of developed and developing nations, vigorous debates have taken place, discovering for the reasons of girls' lower performance in STEM and boys underachievement in arts and humanities subjects (see chapter 2).

Similarly, drawing on the results records published in the years between 2002 and 2016, it is argued that in the context of Pakistani society, there is significant gender gap

in academic performance at school and college levels: girls outperform boys in arts and humanities and boys leading girls in STEM subjects but unlike other societies, the comprehensive studies and debates on the deeper reasons of this gender academic gap in term of performance in SSC and HSSC annual examinations are lacking. Keeping this in view, the coming chapters provide substantial information on the reasons of girls and boys differential performance across different subjects SSC and HSSC annual examinations.

CHAPTER FIVE

GIRLS' OUTPERFORMANCE: RESPONDENTS' PERSPECTIVE

5.1 Introduction

Chapter No 4 spotlighted boys' and girls' performance in SSC and HSSC examination of BISE, Peshawar, KP. The analysis of results books reveals gender reverse change in the favor of girls. Like other urban regions of the globe, the findings of this study displayed girls' outperformance in the SSC and HSSC examinations of BISE Peshawar KP. The findings of the previous chapter also show that boys are doing well in the traditionally believed masculine subjects i.e. math, physics and chemistry etc. Keeping in view the vivid outperformance of girls in SSC and HSSC annual examination, this chapter aimed at exploring the underlying causes and reasons of girls' outperformance in SSC and HSSC examinations of BISE Peshawar Khyber Pakhtunkhwa. The chapter uses and analyzes the data collected from study's respondents. The chapter seeks answer to a key question: what are the various reasons of girls' outperformance in SSC and HSSC examinations.

5.2 Background to the Chapter

The analysis in chapter 4 concluded that girls outperform boys in SSC and HSSC annual examination held under BISE Peshawar, KP (see chapter 4 for detail). The issue of girls' outperformance has been debated and researched irrespective of the developed and developing countries (Dunne et al., 2005; Jha & Kelleher, 2006; Mbugua et al., 2012; Mike Younger & Cobbett, 2014). The findings of these cited studies have identified a number of factors of girls' outperformance in education at both school and college levels (see chapter 2 for detailed discussion).

It is pertinent to mention that studies are lacking on the causes and factors of girls' outperformance in the context of Peshawar, KP. However, a diversity of opinions were expressed by the study's respondents on the various reasons of girls' outstanding performance in the SSC and HSSC annual examinations held under BISE Peshawar, KP. These views and opinions of the respondents enabled me to understand the causes of this gender reversal change in the SSC and HSSC examination of BISE Peshawar, KP. It is considered to mention that the findings of this study confirm some of the factors identified in research studies of industrializing and industrialized societies (see chapter two for detailed discussion). The forthcoming discussion turns to the debate on the following important reasons of girls' outperformance derived from the data.

5.3 Sensibility and Girls' Outperformance in Education

The concept of sensibility emerged in eighteenth century in the field of sense perception. Sensibility is a broad concept which covers maturity, obedience, neatness, hard work and dedication. Barker-Benfield (1996) asserts that sensibility refers to a perception of responsiveness towards something with due attention and dedication. The study findings reveal sensibility (maturity, obedience, neatness, hard work and dedication) as one of the key reasons of girls' outperformance in education. The findings of the study position girls as sensible, concerned, hard worker and focused on their studies. Several study's respondents (school and College teachers) argued that "girls are more sensitive and concerned about their work. They are concerned not only about their education but also other domestic assignments. In short, they have more sense of responsibility". An almost similar response was given by another respondent who asserted that "girls are sensible than boys. They have more sense of responsibility. They

are more obedient". Reinforcing the mentioned argument. One of the senior lecturer argued that: "Girls are very sensitive and take every activity very seriously". A female school teacher asserted that:

> Girls are trained and socialized in the way that sensibility and responsibility become the indispensable part of their personality. For example, they are given responsibility at a very early age which makes them accountable and serious. This positioning of girls makes them accountable. This helps them when they enter into schools and colleges.

This assertion has roots in social learning theory (see chapter 2 for detailed discussion) which states that individual learns in social contexts through reward and punishment. Living role models, observations and imitations impact the learning of an individual. Based on the concept of observation and imitation, it is argued that girls have got the role model in home in the form of mother. They observe and imitate their mother which in turn creates in them a sense of responsibility and accountability. This sense of responsibility and accountability later on helps them in school and college.

It is important to highlight that all girls are not sensible and are behaving in quite masculine way but are still outstripping boys in education in developed countries. This exemplifies what (Francis, 2002) argued in her book "*Boys, girls and achievement: Addressing the classroom issues*" that all girls are not sensible and they are behaving in quite masculine way but they are competing boys in classroom learning in industrialized societies. The point to be noted here is that gender in the developed countries context, is no longer important and there is no differences in masculinity and femininity (Kindlon, 2007). Kindlon further asserted that gender has a role and have influence on the lives of

individuals in developing and traditional societies. Based on this, I assert that girls in Peshawar, KP, traditionally are understood to be sensible and obedient. This label of being sensible and obedient makes them responsible which later on help them in their education.

Drawing on the responses, it can be argued that early socialization and interaction of parents with their daughters construct them sensible and serious. Girls in our society are expected to be sensible and accountable. They are academically focused and sensible. Unlike boys, girls typically demonstrate more positive and responsible behavior in classrooms that enhances their learning capabilities in many societies (Chiu & Chow, 2010; Wagemaker, 1996). They unanimously asserted that such behavior is becoming feminine in many societies that edges girls in school and colleges. In line with this, Darling & Glendinning, 1996 and Mungoo (2017) argued that girls' sensible and accountable nature confirm school and college expectations which result in their outstanding performance in examinations. This is in line with what Francis, (2000) argued that academic success is compatible with feminine behavior i.e. sensibility and responsibility. This means that in many societies, masculinity comes in odd with educational attainment. As argued by Chiu and Chow (2010) that male students have more discipline and behavioral issues. They further argued that such problems intervene with their studies and affect their academic performance. In sum, the crux of the argument is that the outperformance of girls are the response of feminine traits i.e. sensibility, maturity and responsibility which they develop in family through interaction and early socialization.

5.4 Family Surveillance and Girls' Outperformance in Education

The study responses suggest that family surveillance is an important factor in girls' outperformance in education. There is proper check on girls. For instance, preventing them from indulging in undesired activities may affect their studies positively. Many of the study's respondents affirmed that the check and balance on girls is a key factor of their outstanding performance in education. One of the common response from the analysis of data is:

> There are proper check and balance on girls from family side (We teach girls in academy, they come on time and go back home on time either with their brothers or fathers). They are under the surveillance of their parents which prevent them to be involved in undesired activities.

An almost indistinguishable response was given by a teacher. He argued that "girls are under strict surveillance of their parents and brothers. This surveillance stops them from unwanted and antisocial activities which may positively affect their studies".

The above responses indicate the positive impacts of family surveillance on girls' educational performance. Similar findings were found by (Spera et al., 2009)in their study on *Parental aspirations for their children's educational attainment*. They argued that parents' check and balance on girls, results in their outperformance in education. This is in line with assertion and conclusion given by (Eccles, 1994). Eccles found that parents are more concerned about girls' activities than sons. This concern of parents with girls prevents girls to enter into bad companies that may affect their learning.

Keeping in view the above assertions, I argue that parents check and balance on their female children prevent them from indulging in activities which waste their time

and distract them from their studies. This advantages girls and results in their outstanding performance in SSC and HSSC annual examinations.

5.5 Restricted Mobility and Girls' Outperformance in Education

Depending upon the cultural context, along with other factors, studies found positive impacts of parental involvement on daughters' activities (Blair, 2014). Blair asserts that in traditional societies, parents keep eyes on the activities of children, especially on female children's activities, which, in turn, prevent them to waste their time. He concluded his study with assertion that such strict check and balance limit girls to homes and schools. This is in line with what the study findings suggest that girls restricted mobility buttress and boost their educational performance. A considerable number of my respondents told that limited mobility of girls enable them to spend more time in their studies which results in their outperformance. The respondents in great number said that "girls' stay at home enables them to spend more time in their studies". An almost identical response was given by another respondent who asserted that "restricted mobility confines girls to their homes. They (girls) unlike boys don't go outside unnecessary. Therefore, they get maximum time for study which in turn, results in their outperformance in education".

A school teacher argued that "girls live in two places: a) in homes; b) in schools". This means that their time is not wasted in activities outside home i.e., driving, going outside with friends, play games etc. An almost similar response was given by another teacher who told that "girls spend their maximum time at home. Unlike boys, they do not wonder outside homes. This restricted mobility gives them opportunity to spend their maximum time in studies and home works.

To conclude the discussion, it can be asserted that in the locale of this study, parental involvement in female child activities resulted in their outstanding performance in secondary and higher secondary education. The point to be noted here is that parents are more worried and concerned regarding daughters outdoor movement and they do not allow them to mix with friend and engage in outdoor activities. This restriction gives them opportunity to spend maximum time in studies which may be a contributing factor in their good performance in education.

5.6 Lack of Access to Outdoor Sports and Girls Outperformance in Education

As noted earlier that restricted mobility prevents girls to involve in outdoor sports. Girls, unlike boys, don not have access to outdoor sports which obviously saves their precious time. As highlighted by Hofferth and Sandberg (2001) that restricted mobility stops girls from involving in sports and other activities which may negatively affect girls' education. This study's findings are in line with what Hofferth and Sandberg found. One of the common findings in the data was girls' non-participation in outdoor sports. One of the respondents particularly argued:

> Girls are outperforming boys in education as they do not have access to outdoor sports and recreational activities. They do not waste their time in playing sports, driving and walking outside home with friends. It gives them more time to spend in their studies.

Another respondent claimed that "girls, as compared to boys, have no access to participate in outdoor sports".

In the light of these responses, it can be argued that restriction on girls' outdoor games contribute positively in their studies. Similar findings were found in the studies

conducted in late 1990s. For example, Valentine and McKendrck (1997) concluded their study with the assertion that girls have no permission to engage in outdoor sports and thus, get more time for their studies. The point to be noted here is that having restrictions on girls' involvement in outdoor sports and activities resulted in their outstanding performance in education.

5.7 Limited Use of Social Media by Girls and Their Outperformance in Education

This is one of the established arguments that excessive use of social media by students badly affect their academic performance (Yeboah & Ewur, 2014). They further asserted that boys use social media more than girls. The excessive use of social media by boys leads to their underperformance in education. The findings of this study suggest that limited use of social media is one of the key factors that lead to girls' outperformance in education. Many of the study's respondents shared that the limited use of mobile and social media by girls help them in their studies: One of the respondents told:

> Girls student do not have permission to use mobile phone for a longer time. They do not have access to use mobile internet, play games which help them to save their time. As a result they get maximum time for their studies.

Another respondent argued that "girls are outperforming in education because they do not have access to social media". These responses attest the argument that girls, as compared to boys, have little access to social media which help them to focus on their studies which, in turn, results in their outperformance. Similar findings have been spotlighted by Yeboah and Ewur (2014). Yeboah and Ewur found that girls in developing countries had little access to the use of social media which brings positive impact on their

educational performance. Building on the work of Yeboah and Ewur, I may argue that girls in the locale of this study, like other developing societies, do not have access to use social media. Thus, it can be argued that lack or limited use of social media is an important factor of girls' outperformance in education in Peshawar, KP.

5.8 Girls' inferior position

Broadly speaking, inferiority complex consists of feelings, having life below standards, a complete distrust, uncertainty about oneself and a lack of self-respect (Popenoe, 1939). Popenoe further mentioned that such feelings motivate individual towards success. For example, inferiority complex as asserted by Timothy (2000), motivates and pushes individual to come out of the existing upsetting situation. This study's findings authenticate the aforesaid opinions. A considerable number of respondents highlighted that they witness gender discrimination in their society which cause inferior feeling among girls which motivates them to perform well in education. Following quotation is one of the several quotations presented here to buttress the aforementioned argument.

> Pakistan is a developing country. We have experienced gender discrimination. Due to this gender discrimination, girls are the victims of inferiority complex. This inferiority complex has created a situation of doing or dying for them. Therefore, they are doing well in education.

One of the respondents asserted that "girls are doing well in education. Girls are struggling and do well for their fame and want to be admired in society". Another similar response was given by another respondent who argued that "girls think that education is the only way through which they can get respect and prestige in society". These

responses enable me to argue that inferiority complex is working as a motivational factor of girls' outperformance in education. Girls across the globe have experienced gender discrimination which caused inferior feelings in them. This inferior feeling has worked for girls to get success. This is in conformity with findings of Lin. (Lin, 1997) stated that inferiority complex boosts girls to get a successful life. The findings of this study add new insight to the existing body of knowledge by outlining inferiority complex as contributing factor in girls' outperformance in education.

5.9 Girls' Urge for Better Life and Their Outperformance in Education

There is no disagreement of opinion that girls, as compared to boys, have limited chances of achieving good life. Historically, as asserted by Robeyns (2003) that girls have confronted more barriers in their journey towards better life than boys. The case of girls in Pakistan is not different from Robeyns stance. According to Memon (2007) girls face more issues and challenges in their way to bright future. This study finding substantiates the aforementioned arguments by spotlighting that education is the best tool by which girls can secure good life in society. Following excerption is one of the several excerptions that affirm the statement.

> Education is the only tool for girls through which they can easily secure better life. They think that we can go ahead in life due to getting education. This belief in education motivates them to work hard in the field of education which results in their outperformance.

An almost similar view was expressed by another respondent who stated that "girls are outperforming in education because they think that they can get bright future only by getting education". These responses show that girls over the time have been

deprived from their rights including education in our society. This deprivation of women from a better life in the past, have motivated them today to get education which they deem the only way to get good life and ensure their rights. They think that education can save them from the troubles faced by them in past. This led me to engage the findings of the study conducted by Francis (2002). She argued that girls have more inspiration and drive to achieve better life in a male dominated and gender discriminatory society.

5.10 Girls' Desire for Top Position and Their Outperformance in Education

Historically, girls were deprived from education across societies (see chapter 1 & 2). Pakistan is no exception. Girls' increasing access to education in the last few decades, have shown an urge and eagerness to work hard in the study. This urge and passion, undoubtedly, lead to their outperformance in education. This study finding attests the aforementioned argument. One of the responses is summarized here as under:

> Girls like competition and want to excel in life. Similarly, they have more desires than boys for getting top positions in examination. They value top positions and therefore working hard to secure top positions in examination. This urge for getting top positions leads to their outstanding performance in education.

Another respondent asserted that "girls value top positions in exam more than boys to prove themselves distinctive". These responses clearly demonstrate that girls' urge for having top positions in exam motivates and boosts them to work hard in their studies. These findings are not new but found in other societies. For example, Raychaudhuri et al.,(2010) unpacked in their study *on factors affecting students' performance.* They highlighted that girls' focus on the top positions results in their

outstanding performance in examinations. It is, therefore, argued here that urge for top positions among girls is one the core factors of their outstanding academic performance.

5.11 A Change in Parents' Attitude towards Girls' Education

Parents' desire for daughters' education encourages and supports girls to get education (Glick & Sahn, 2000). They further asserted that today parents are more serious about their daughters' education as compared to the past. My study's findings are similar to those of Glick and Sahn's study. A considerable number of respondents in my study highlighted that" in our society, today parents are more conscious about their female child education which motivates and encourages girls to do well in education". Another respondent told that "parental desire for daughter education is one of the key factors in their outstanding academic performance. Parents think that education can give them good life".

The general belief and discourses that are circulated in society construct female as guests in their parents' homes. They have to get marry and go their husbands' homes. This creates a sense of insecurity among parents about their female child. This is well explained by Goolamally and Ahmad (2010). According to them girls' outperformance in education is linked with the perception of uncertainty that parents have about their daughters' future. They further asserted that such perception make them more conscious and concern about their daughters' education. Similar findings were found by Sreekanth (2010). Sreekanth found that parents do not have trust in daughters to secure bright future without education. This belief of parents has resulted in the outperformance of girls in education. The findings of Goolamally and Ahmad and Sreekanth show greater relevance with this study's findings. The respondents of the understudy have also pointed to the

parental concerns for their daughter education. The crux of the argument is that parents in urban KP, have incessant interest and desire for their daughters' education.

5.12 Examination System Favors Girls

As highlighted in chapter 2, that girls outperform boys in education. A number of factors have been identified by many researchers of this new gender reversal change in education. Majority of these studies link girls' outstanding performance with their hard work, dedication, opportunities, parental desire etc. (see chapter 2 for detailed discussion). There are studies that give quite different views about girls' outperformance. For example, Elwood (2005) in his study *gender and achievement* argues that examinations had a complex role in creating and defining gender differences in performance in examinations. This clearly indicates that examination system and paper pattern support girls more than boys which result in girls' outperformance in education. The respondents in this study also referred the existing examination system as one of the key factors of girls' outperformance. One of the respondents stated: "girls are good crammer. Our examination system encourages cramming". He further asserted that the investigation in girls exam halls are not that much strict as it is in boys' exam hall". An almost similar response was given by another respondent who asserted that" our paper pattern is not conceptual. It favors female students as they are good crammer". These responses demonstrate that girls outperformance in education is associated with examination system and paper pattern. Findings of a recent study reveal that girls are outdoing boys in examination as they cram the lesson on exam day (Bennett, 2017). He further argued that girls are outclassing boys in education but that does not mean that they are brighter students than boys. The thing which is important in girls'

outperformance is that examinations and paper pattern favor them more than boys. The point to be highlighted here is that girls' hard work and ability are belittled by an essentialist discourse –girls are crammers. The overall evidence in Pakistani context may deny girls' outperformance on the cramming ground.

5.13 Conclusion

The chapter explored teachers and paper marking expert's perspective on girls' outperformance in SSC and HSSC annual examination of BISE Peshawar, KP. The findings of the chapter revealed some key factors contributing to girls' good performance in the mentioned examinations. The findings show that sensible and responsible nature of girls is contributing factors toward their outstanding performance in examination held at school and college levels. On the basis of respondents' opinions, it is argued that sensibility and responsibility in our society are considered feminine values which are at the likelihood with educational achievement. The findings also showed that girl inferior position in society creates an urge of hard work to secure good life. Timothy (2000) asserted that inferiority complex motivates and pushes individual to come out of the existing upsetting situation. In summary, it can be argued that girls outperformance in education is claimed as the result of their limited mobility outside home, their restricted use of social media, their hard work to prove that they can do as good as boys if provided opportunity. In addition to these, the stereotypical attribute i.e. cramming is also associated with girls' success in examination.

CHAPTER SIX

REASONS OF BOYS' UNDERPERFORMANCE IN SSC AND HSSC EXAMINATION OF BISE PESHAWAR, KP

6.1 Introduction

Chapter 5 outlined and highlighted various reasons of girls' outperformance in the SSC and HSSC examinations of BISE, Peshawar. As discussed in the review of literature chapter, it is extensively accepted that boys underperform in secondary and higher secondary education. The issue of boys underachieving in education is of recent emergence. For instance, until mid-1970s, it was not boys' underperformance, but it was girls' underperformance which was identified a phenomenon (see review of literature in this study). Nevertheless, after 20 years, in 1990s, boys' underperformance in education became the focus of attention of many researchers particularly in developed countries (Epstein et al., 1998; Frosh et al., 2002). However, in developing countries the issue of boys' underperformance was not explored till early 1990s. Soon the issue got attention of many researchers (see chapter 2) who identified a number of key factors that were claimed to be contributing to boys' underperformance (Buchmann & DiPrete, 2006; Charles & Luoh, 2003).

Like other societies, boys' underperformance in education is taking place in Pakistani context. The findings of Aslam (2009) and Agrawal and Nehajul' s (2017) studies showed that boys are underperforming in secondary and higher secondary education for the last 15 years in the urban centers of Pakistan. Like other urban centers of Pakistan, boys are underperforming in secondary and higher secondary education in Peshawar, KP (see chapter 4 for detailed discussion). It is important to mention here that

I have not come across any study so far that look into the reasons of boys' underperformance in KP. This chapter aims to explore the reasons of boys' underperformance in the SSC and HSSC annual examinations of BISE, Peshawar, KP. The chapter explored some important reasons of boys' underperformance from the perspective of study's respondents. It is important to mention here that the findings of this study are different from the findings of the studies in developed countries. The data is presented and discussed under the following headings.

6.2 More Love and Affection

The study findings reveal that more love and freedom is the core reasons of boys' underperformance in education. The findings of the study described here propose that more love and affection spoil boys which later on influence their studies badly. The following extract from the data is presented as an evidence of the claim. One of the respondents argued:

> Parents give more love and affection to sons as compared to daughters. Sons enjoy high status and freedom in home. This freedom and high status often spoil them. They get involved in various bad activities which, in turn, badly influence their performance in education.

An almost similar response was given by another respondent who asserted that "excessive love and affection make boys careless. Their careless behaviors later on continue in school". Another respondent said that "boys are given more importance in family. This deviates them from their studies". One of the respondents told that:

> Boys' underperformance in education is linked with their personal freedom and higher status in family. The unconditional love and

> affection boys receive from parents' spoil and create many negative habits in them which adversely affect their performance in examinations.

These responses show that unconditional love and affection make boys irresponsible which badly influence their performance in education. In addition to love and affection, boys enjoy more freedom in terms of their mobility and activities which adversely affect their studies. This is in line with P. Brown et al.,'s (2010) assertion that boys' poor performance in education is due to their personal freedom and higher status in family. In summary, it can be argued that one of the key reasons of boys' underperformance in education is parental undue attention and excessive love and freedom, they give to their sons.

More love and freedom in family lead to lack of obedience and diligence among boys. Alanen & Mayall (2001) assert that excessive love and high status in family lead to disobedience and lack of seriousness among boys in school which, in turn, badly affect their studies. The two traits i.e. obedience and diligence of students are crucial in classroom for effective learning (Francis, 2002). This Study's findings go in line with Fransic assertion by suggesting that obedience is one of the main factors of boys' underperformance in education. One of the respondents argued:

> Personal freedom and high status create lack of obedience and diligence among boys. They do not obey their parents and teachers (both in schools and colleges). Such behavior in schools and colleges undoubtedly results in their underperformance in education.

Undue love and freedom spoil sons. Another respondent argued that "boys do fight in school and are not serious in studies. They remain absent from school which

affect their studies". This means that boys do not obey their teachers and are not serious in studies which affect their performance. The disobedience and carelessness among boys are considered as masculine traits. This particular construction of masculinity in our society has effects on boys learning. It is important to note that such particular construction of masculinity in our society may have negative consequences for learning.

The above responses enable me to argue that obedience and diligence are necessary for the outstanding performance of boys in education. Similar findings have been discussed by Francis, (2002) in her study on "*Boys, girls and achievement: Addressing the classroom issues*". She argued that boys are louder, disobedient and estranged from learning in classroom. She further asserted that such behavior is impeding boys' achievement in school and college. She concluded her study with the assertion that learning in classroom requires concentration and attentiveness. This study's findings, thus, show that disobedient and lack of the diligence among boys as the core reasons of their ' underperformance in education.

6.3 Father Absence and Boys' Underperformance in Education

Research studies in different socio-cultural contexts associate and establish link between the absence of fathers and boys' underachievement in education (Ogbu, 2003). The findings of this study are similar to the findings given by Ogbu. The findings of my study reveal that father living abroad or away from home is one of the key factors of boys' underachievement in education in the context of KP. This study finding also unfold that sons, in the absence of their fathers, indulge in various types of bad activities that

distract their attention from studies. Following excerpt is one of the several excerpts that attest the assertion.

> In our society, mostly father live away from home for work/labor within the country or abroad. There is no check and balance on children, especially on male children. As a result, they easily fall in bad activities which badly affect their academic performance.

Another respondent argue that "mostly parents are living away from their country. Sons in majority of cases do not face any hurdle to go out. They spend their time with friends in outdoor activities". This means that sons, in the absence of fathers, do not have restrictions on their mobility and activities. An almost similar view was expressed by another respondent who argued that "unfortunately, our students come from middle class whose parents are either working abroad or within the country. In their absence, their sons indulge in bad activities which spoil them and their studies"

The above responses refer to the importance of father presence and involvement in educational achievement of their children. Parents' particularly, fathers' check and balance on their children significantly affect the educational performance of their children (Spera et al., 2009). This is reinforced by Ogbu (2003), who asserted when father lives abroad, his male children do not take their studies seriously. They spend less time in their studies which results in their underperformance.

It is pertinent to mention here that the absence of fathers' surveillance on their sons let them easy prey to fall in bad company. The findings of the understudy research suggest that bad company has detrimental effects on boys' education. One of the respondents told, "Boys spend maximum of their time out of homes in bad companies,

indulging in smoking, celebration of weekend. These habits badly affect their educational performance". An almost similar response was given by another respondent, who stated: "boys are spending their maximum time with friends in watching movies and playing games. They get little time for their studies".

6.4. Excessive Use of Social Media

Absence of father and bad company push boys towards various negative activities including excessive use of social media that affect their educational performance. Boys had more freedom in prevailing cultural landscape of the society than girls as they have easy access to social media. The study findings reveal that excessive use of social media among boys have brought damaging effects on their educational performance. A considerable number of my respondents told that "boys' underperformance in education is linked with their excessive use of mobile and social media which adversely affect their studies". They further said, "due to excessive use of social media, they are not getting maximum time for their studies". A senior lecturer's response as quoted here as:

> In teen age, using mobile phone and having access to net is not only dangerous for their studies but this also motivates them to indulge in various immoral activities. They spend much time in using Facebook and playing games. They play games on mobile for hours and get no time for their studies.

A similar response was held by school principal who argued that "boys are underperforming in education because they have access to use mobile phone and internet which pushes them in bad direction". These responses suggest that excessive use of social

media badly affects the performance of boys in education. The study's findings show greater similarity with the findings of studies researched by other researchers. For example, Furrer and Skinner (2003) argued that there is a link between excessive use of social media and boys' underperformance in education. Thus, it is argued that access to social media especially in teen age brings adverse consequences to boys' studies.

6.5 Boys' Free Mobility and Unrestrained Outdoor Activities

The study findings reveal that engagement of boys in outdoor activities (sports, driving, going market, *hujra* etc.) result in boys' underachievement in education. They waste much of their time in extracurricular activities and do not get enough time for studies. Following extract is one of the several extracts from field data that attest the claim:

> Boys, as compared to girls, have more opportunities to involve in outdoor activities (sports, driving, going market) which distract them from their studies. They are wasting maximum of their time in playing different games, driving cars and spending time with friends in *hujras.* These activities badly affect their studies.

Another respondent added that "boys don’t have access to these activities during their early school (till primary level). Therefore, they perform well in their studies. As soon as they enter middle level, they get exposure to these activities which affect their academic performance." This means that when they are not involved in such extra curriculum activities, they are doing well in education.

An almost similar response was given by another respondent by arguing that" boys underperform in education as they spend too much time in playgrounds". A third

respondent stated: "boys go outside home, spend maximum time in *hujrah* with friends, having no plan for their studies". The link between boys' excessive involvement in extracurricular activities and their poor academic performance is also reinforced by another respondent. He argued that "boys have other channels for themselves which keep them away from studies. For example, they go out, spend time with friends and may easily engage in bad activities" Another respondent told "boys have extra activities which cause their underperformance in education".

In a nutshell, it can be argued that boys access to outdoor activities negatively affect their studies. Boys' excessive engagement in outdoor activities resulted in boys' underperformance in education. These findings attest the findings of Anderson et al., (1988) research who found that boys spend too much time outside home. They also asserted that boys, apart from sports easily involve in activities that are dangerous for their studies. The findings of this study, thus add to the existing scholarship on boys' underperformance in education by highlighting the negative consequences of extra curriculum activities on boys studies in Pakistan.

6.6 Boys' Engagement in Work other than Studies

Some of the respondents attribute boys' underperformance in education to their work burden. Boys, along with their schooling, perform labor work to assist their parents in fulfilling the needs of their family which adversely affect their educational performance. Boys' underperformance is linked with the engagement of them in socio-economic activities (see literature). A summary of the quotes of few respondents are given below evidence of the claim.

> The family financial position has significant role in boys' underperformance in education. We have majority of the working and middle classes students. They, along with their study, are engaged in labor work or do part time jobs or assist their parents. This badly influences their academic performance in education.

Another respondent told that "boys are facing too much burden in assisting their parents in business and other activities. Boys' engagement in these activities divert their attention from studies". Similar response was given by another respondent who stated: "We have students from a very poor background who help and assist their parents. This affects their studies and falling behind".

These responses demonstrate that boys along with their studies also assist their parents to meet their family needs. This engagement of boys in the socio-economic activities adversely affects their academic performance. The study's findings are similar with those identified by Reimer (2012). For example, his study findings revealed that boys engage in various labour works which badly affect their educational achievement. Similarly, the findings of the study conducted by Jha & Kelleher (2006), support the study's findings by emphasizing that in many developing countries the issue of boys' underperformance in education has largely associated with the socio-economic status of the family. The study's findings, thus, strengthen the argument that work burden of boys, in addition to their studies, badly affect their educational performance.

6.7 Conclusion

The chapter has highlighted the plight of boys' underperformance in education at school and college levels in Peshawar, KP. The chapter explored the underlying reasons

of boys' underperformance in SSC and HSSC examination of BISE Peshawar, KP. The findings of the chapter revealed that more love and affection, father absence/living away of home, bad company, excessive use of social media, free mobility and engagement in socio-economic activities of the family are the leading factors of boys underachieving in examinations. As noted, that the issue of boys' poor performance is an emerging issue (see review of literature) and specifically in the context of Pakistani society, this issue has not yet examined and explored by researchers. Like other regions of Pakistan, as mentioned in chapter 2, researchers have not inquired the reasons of boys' underperformance in examinations in Peshawar, Khyber Pakhtunkhwa. There is lack of debate and evidences except the results of SSC and HSSC annual examination records that show that boys underperform in secondary and higher secondary education. It is therefore, stated, that the study's findings suggest some important reasons of boys' underperformance in key annual examinations of BISE, Peshawar, KP. The findings provide new insight to the understanding of boys' underperformance. These findings can play a decisive role to overcome the issue of boys' underperformance in education, and narrow down the gendered performance gap in SSC and HSSC examinations of BISE, Peshawar, KP.

CHAPTER SEVEN

EDUCATIONISTS' VIEWS ON BOYS' AND GIRLS' SUBJECT WISE PERFORMANCE

7.1 Introduction

The gender gap, favoring girls, has been observed in education in the global north and the global south. The general trend is that girls outshine boys in education. However, there are studies which reveal that girls are still lagging behind in Science, Technology, Engineering, and Math subjects (see chapter 2 for detailed discussion). The studies in the global north and the global south have unearthed a number of factors of girls' underperformance in STEM subjects (Baker & Jones, 1993; Hedges & Nowell, 1995; McDonald et al., 2011; Mead, 2006; A. Smith, 2010; Ullah & Ullah, n.d.). It is pertinent to mention here that all girls are not underperforming in STEM subjects. The review of literature chapter spotlighted that some girls in the developed countries are doing well in STEM subjects. In some cases, they outclass boys in STEM education. It is important to recap here again that in developed countries where girls outperform boys in STEM subjects, reaping all the advantages as in such societies' gender no longer matters (Kindlon, 2007). Pomerantz et al. (2017) in their book *Smart girls: Success, school, and the myth of post-feminism* asserted that girls in west grow in a culture that is infused with gender balanced power. They further argued that in such gender balanced power society, girls' performance in STEM subjects is similar to boys. They concluded that in some cases even, girls outshine them in science and mathematics subjects.

However, it is definitely the case that girls are lagging behind in STEM subjects in developing countries. Like other developing countries, there is huge gap in STEM

education in Pakistani society (see chapter 4). The point to be noted here is that the socio-cultural context of Pakistan is different from the western society. Unlike western societies, girls in Pakistan are not gaining the opportunities and facilities available to boys. Girls grow in environment and culture where people consider STEM subjects appropriate for boys. This stereotypical belief about subjects badly affects their interest and performance in STEM subjects. Girls' performance in STEM subjects is poor. Girls are lagging behind boys in STEM. This chapter, thus, provides insight into the causes of gender disparity in academic performance with special attention to STEM subjects. The findings of the chapter highlight and endorse many of the factors documented in different socio-cultural context across the world. In the forthcoming discussion, some of the important factors, emerged from data, on subjects wise performance of boys and girls are presented. These factors are thought to be responsible for the gender gap in STEM and Humanities subjects in the SSC and HSSC annual examinations of BISE Peshawar, KP.

7.2 Boys' and Girls' Performance in STEM: Culture Matters

The culture and social context of any society affect the performance and interest of boys and girls in education differently. For instance, as highlighted by Chiu and Chow, (2010) that in societies having male dominancy girls and boys have different interest and choices. They asserted that in such societies' girls have lower ambitions for STEM education and jobs. The study's findings also reveal that culture discourages girls' student to come in the field of STEM subjects. It was unearthed that hard science/pure science is considered inappropriate for girls. Following responses of school and college teachers are few of the several responses to be presented here to buttress the argument. One of the respondents stated:

> I firmly believe that girls can also do well in science subjects if they are given favorable environment like boys. For example, in our society, unlike, boys, culture discourages girls to join coaching classes for science subjects. Our culture deems these subjects inappropriate for girls' student.

A similar point of view was held by a senior science school teacher who argued:

> Our culture and traditions are responsible for gendered performance in education. For example, girls are considered suitable for teaching, doctor and nursing professions in society. On the other hand, boys are encouraged to be engineer, pilot and join the varieties of other jobs in the public domain.

The above quotes indicate that gender disparity in performance in STEM subject results from cultural forces and socialization process. This is also highlighted in the studies of stereotypes and identity threat (Aronson & McGlone, 2009; Nosek et al., 2009). The central argument of these studies is that STEM interest and performance is highly influenced by cultural pressure and beliefs.

A female teacher asserted: "a girl who is teacher or doctor is preferred for marriage. People do not marry a girl who is associated with a profession that involves public dealing and interaction". This is well explained by a respondent who told that" our culture are responsible for the underachievement of girls in science subjects because the jobs associated with these subjects are not liked and accepted in our culture". Another respondent expressed that "our culture has idealized teaching and doctor profession for girls." A male College lecturer argued:

> Our culture is responsible for the gendered performance in science subjects. From the very outset, female child is given doll and male child is given vehicle. Boys are playing with machine and girls with accessories and dolls' home. This inspires boys and girls in different educational directions.

It can be argued that the gendered experiences in early childhood (pre-school time) may be a reason for girls' lack of interest and poor performance in science subjects. Similar finding has been given by (Iraki, 1994). He asserted that girls should be given equal space in culture to experience the 'scientific activities' that will boost their societal orientation towards science. This embodies what Davies (1989) called 'gender duality" which pushes boys and girls into different sets of behaviors. It may be asserted here that the consequences of this gender duality are reflected in the later stages.

Keeping in view the responses, cited above, it is asserted that girls can learn and perform well in STEM subjects, if they receive equal opportunities and environment for studying STEM subjects. This allows me to engage Nancy Cott, who asserts in her famous work 'difference' and 'sameness' debates in feminism that women have the same intellectual qualities like men but due to cultural constrains, lack of conducive environment and patriarchal structure, women fall behind in STEM education (see theoretical review). The point to be noted here is that the poor performance of girls in STEM and underperformance of boys in Arts and humanities do not arise from the innate differences in abilities but are the outcome of gendered culture and omnipresent nature of patriarchy.

7.3 Girls in STEM: The Influence of Parents and Family

This study found family (parents) lack of interest in STEM subjects for their daughters. The study findings reveal that majority of the respondents believed that parents do not allow their daughters to study science. Parents do not want their daughters to be pilots and engineers. One of the respondents argued:

> In our society, female considers themselves unfit for science subjects. They face problems and restriction from their parents. My own daughter wants to do Chartered Accountant (CA) but my husband does not allow her to do CA with the reason that she will work with male after completing CA.

Another respondent argued that "parents push their daughters to become teachers and they never allow them to join a job that needs public contact".

The above responses reveal that parents are not in the favor of their female children to come into Science, Technology, Engineering and Math subjects. Similar findings were given by Smith, (2011) in her study on "*Women into science and engineering*? *Gender based participation in higher education STEM subjects*". The referred study revealed that parents do not allow their daughter to graduate in science subjects. Parents discourage female students to study science subject and encourage them to study humanities and soft science (Council, 1983).

The above responses has close link with social learning and cultural theories. For example, girls whenever want to study and opt science subjects they are strictly discouraged which in turn adversely influence their interest in STEM subjects from the very outset of their education career. Boys are rewarding in our society in STEM subjects

and this motivates them and performing well in science subjects. In family, girls don't have role model (mother/sister as engineer, math or physics teachers) who may motivate and encourage them to study science subjects.

7.4 Poor Quality of Teaching in Girls' Schools and colleges

Poor quality of teaching for science subject in girls' school was reported as one of the key reasons of girls' underperformance in STEM. Poor quality of science teaching at school level does not enable girls to enter higher education with strong science background. Many of the study respondents revealed that poor teaching, especially at the school level, affects the performance and interest of girls' student in STEM subjects. A respondent argued:

> Unfortunately, we do not have good and well qualified female teachers for science subjects, especially at primary and middle level. Thus, female students enter into secondary and higher secondary level with a very week base which later on result in their underachievement in STEM subjects.

A senior school teacher highlighted that "there is worse quality of teaching in girls' schools causes girls' underperformance in science". Another respondent stated: "girls lag behind in engineering subjects due to lack of subject specialist at school level".

An almost similar response was given by another respondent who asserted that "girls do not have good teacher, for math and science subjects in school. The absence of good science teachers badly affects their performance in science subjects". Another respondent argued that" girls are week in science subjects because female teachers do not have the required skills to teach physics, math and chemistry. One of the respondents

went to the extent declaring female teachers incompetent to teach science subjects. He asserted: "female teachers cannot teach science subject which result in the underperformance of girls in science subjects".

These responses are hinting on two important aspects and deeply rooted beliefs. The first one is more an issue of the structure that female schools lack good science teachers. The second one is the century old stereotypical belief that women are incapable of understanding and teaching science subjects. It is important to note that schooling has important role in the academic journey of any students (Burridge et al., 2012). Boys in our society are sent to private schools, staffed with skillful and qualified teachers. They get a very strong base which later on boosts their performance in STEM subjects. The study findings reveal that school has undeniable role in the outstanding performance of boys in science subjects. To strengthen the argument one of the respondents argued that "boys complete their initial schooling in private schools where they get good teachers and specialists in STEM subjects". Another respondent said that" boys are doing well in STEM subjects because they get qualified teachers at school levels and underperform in arts as they do not have male teacher in arts". This is well explained by a teacher who argued "boys see their role models in school in shape of science teachers which in turn, motivate them to study science subjects. This response led me to engage social learning theory which state that role model has significant part in the construction of one's behavior (see theoretical review in chapter 2). Boys have more role model in school than girls which reinforce their performance in science and arts subjects. Thus, it is asserted that poor teaching at school level is one of the core reasons that affect girls' performance in Science, technology, engineering and math subjects.

7.5 Cramming Style of Learning

The study findings pointed the cramming as one of the key factors of girls' underperformance in STEM. Girls are good crammers and cramming does not work in science and conceptual subjects. One of the respondents argued: "girls are learning lessons by heart which is not possible in STEM subjects. Therefore, they are not doing well in these subjects". Another respondent told: "girls are crammers and undoubtedly this fails in science subjects." Reinforcing the aforementioned arguments, a senior teacher stated: "girls like to cram lesson and thus, science subjects have numerical reasoning which is difficult to be crammed".

Some of the respondents linked the outstanding performance of girls in Arts and Humanities with their girls' habit of cramming. For example, one of the respondents told: "girls are crammers. Math and physics have numerical reasoning which cannot be learnt through cramming". Another respondent stated: "girls like theory instead of numerical problems and conceptual readings.

These responses attribute girls outperformance to their habit of cramming which justifies girls underperformance in STEM subjects with the argument that cramming does not work in STEM.

7.6 Girls, STEM Subjects and Employment Prospects

Jobs in Pakistan in general and KP in particularly are gender based (Ullah, 2012). Jobs associated with STEM subjects are not considered appropriate for girls in our society. The respondents asserted that girls do not come into such subjects because they think that the jobs that they will get after studying STEM subjects are considered inappropriate for girls in society. One of the science lecturers argued:

> Girls are lagging behind than boys in science, technology, and engineering and math subjects. The reason is very clear. Jobs associated with STEM subjects are not considered appropriate for girls. This discourages and prevents girls to study subjects that fall in the domain of science.

An almost similar response was given by another respondent who argued that "job market of STEM subjects compel girls to avoid these subject." Study findings spot culture in the favor of girls to do well in Arts and Humanities. One of the respondents told that "culture plays significant role in the outperformance of girls in arts and humanities subjects. Girls feel safe in the jobs associated with these subjects". This means that our culture do not allow girl to get job that needs exposure and intervention with the men in the public domain (Ullah, 2012). Another respondent believed that" girls are outstripping in arts and humanities subjects because the culture has idealized these subjects for them". These responses point out culture as the key contributing factor in girls' outperformance in arts and humanities as the jobs related to these subjects are in conformity with our cultural values. This means that job prospect is the motivating factor for students to perform well in education. One of the several excerpts is mentioned here to substantiate the argument:

> Boys are doing well in STEM subjects while underperforming in arts and humanities. The jobs associated with STEM subjects are considered masculine and respectable jobs. Jobs associated with arts and humanities are not deemed important in our culture that motivates boys to study these subjects. Therefore, they are taking interest in the STEM subjects.

The crux of the discussion here is that the gendered nature of jobs has gendered the subjects' choice.

7.7 Teaching Profession

School teaching is one of the preferred professions for female (Ullah, 2016). The preference for school teaching for female is not limited to Pakistan but also found in other societies (see chapter two in this study). This glorification and approval of school teaching as the best profession for female discourages young girls to study STEM and aspire for career in the field of science and technology. The findings of this research substantiate the above argument. One of the study respondents argued that "teaching profession is preferred profession for female. This affects girls' performance in STEM subjects". Another respondent stated: "in our culture, people prefer teaching profession for girls. This attitude influences boys and girls performance in education accordingly". It is asserted here that girls if allowed by parents to study STEM subjects, may perform well in historically male dominated subjects. Nevertheless, they are not provided equal opportunities not only at family level but also at school level which greatly affect their performance in science subjects. Parents stereotype these subjects as masculine which discourage girls to take these subjects at school and college level (Vockell & Lobonc, 1981). The prevailing trend of appropriate profession for girls when look into from social learning theory lens enable me to argue that reward and punishment in the study locale reinforced gendered behavior. Connecting it with education, it is argued here that in our society girls' in STEM subjects are discouraged and this results in their underperformance in the mentioned subjects (See chapter 4).

7.8 Conclusion

In summary, it can be argued that girls' underperformance in STEM subjects is the result of cultural factors not innate abilities and differences. The chapter identified some important factors that prevent girls from accessing STEM fields, namely, cultural and family influences, poor quality of teaching in girls' school, nature of jobs associated with STEM fields, learning style of girls and teaching profession. The findings found that girls who want to come in STEM subjects and adopt career in STEM fields were discouraged by gendered culture and family. Supporting the idea of gendered culture and family influences, the chapter also focuses on gendered socialization. Girls and boys are socialized differently in Peshawar, KP. For instance, boys are raised to confirm to the male gender role and girls are socialized to confirm to the female gender role. Girls are leaving the STEM field is because girls are bombarded with this early socialized ideas and negative stereotypes. Based on respondents' opinion, I argue that these mentalities and stereotypes are communicated to girls at a young age through their family and culture.

Poor quality of teaching in girls' school is also declared one of the important factors of girls' underperformance in STEM subjects. The study also found career choice, learning style of girls and teaching profession are the main factors that influence not only girls' performance but also their interest in STEM subjects. For example, girls are discouraged to choose career path in STEM filed because of its nature, the work involved and the norms of the career and job. All these discourage girls to enter into STEM fields (Cheryan et al., 2015). Careers under STEM umbrella are male oriented in our culture and certainly that influence girls interest and performance in STEM subjects. For

instance, parents strictly discouraged participation and interest of daughters in STEM subjects and is afraid of the fact that it would hinder marriage prospects. Drawing on the respondents views, it is argued here that girls have no role models in STEM fields that eventually influence their interest and performance in STEM education. It is, therefore, argued that girls' interest may be increased when they are exposed to role model in STEM fields. In other words, if they see girls working as scientists, engineers, software engineers and pilots in their surroundings. The study findings are with conformity with feminist approach of gender and education. feminist researchers reject the role of genetics and sex differences and claim that theory of brain or sex differences are highly biased and deficit to explain the issue of girls' underperformance in STEM subjects (Clark Blickenstaff, 2005) Drawing on the feminist approach of gender and education, it is argued that girls' underperformance in STEM subjects are the direct response of social and cultural factors. The construction of femininity in our society, are not considered appropriate for STEM education and fields, which influence girls' interest in the mentioned subjects. It is evident from the above discussion that people perceive STEM field as something male and interest in such domain is indicator of masculinity.

Building on the above discussion, I conceivably argue that girls performance which is linking with sex difference and theories of brain, are not efficient to justify girls' position in STEM fields. This essentialists and biological explanations postulate that girls underperformance in science is a natural outgrowth of biologically based sex-typed predispositions. Nonetheless, the results of this study show that if study friendly environment are provided to girls and people no longer label STEM as male terrain. This would enhance girls' interest and performance in STEM subjects. It is, therefore, seems

that the incompatibility of the STEM -preferring prototype to female students' has its links with the perception of people about STEM education. Recent scholarships also supports such views and does not accept essentialist and biological explanations (Cheryan et al., 2009; Murphy, steele & Gross 2007; Stout et al., 2011).

CHAPTER EIGHT

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

8.1 Summary of the Argument

This study examined the gender reverse change in educational performance in Khyber Pakhtunkhwa. The content analysis of SSC and HSSC results revealed a vivid gap in girls' and boys' education performance. The analysis unpacked that girls have been outperforming boys in education. This gender reverse trend has been presented in chapter four (see table 4.1, 4.2, 4.3 & 4.4). Chapter four also outlined the subject wise performance of boys and girls. Similarly, the quantitative content analysis of girls' and boys' performance in STEM revealed that girls are lagging behind boys in STEM subjects (see Table 4.5.1).

Chapters five and six unpacked the factors that are perceived as contributing factors of girls' outperformance and boys' underperformance in SSC and HSSC examinations. The reasons and factors that educationists in Peshawar, KP thought for girls' outperformance and boys' underperformance are summarized in table 8.1.

Table 8.1
Contributing Factors to Girls' Outperformance and Boys' Underperformance

Factors of girls' outperformance	Reasons of boys' underperformance
Sensibility and Accountability	More Love and Affection
Family Surveillance	Father Absence due to Death, Work
Restricted Mobility	Excessive use of Social Media
Lack of Access to Outdoor Sports	Boys' Free Mobility
Limited Use of Social Media	
Girls Inferior Position	
Girls' Urge for Better Life	Boys' Engagement in Work other than Studies
Girls' Desire for Top Position	
Change in Parents' Attitude towards Girls' Education	
Examination System	

The above are contributing factors that educationists in the context of KP believed to be responsible for girls' outperformance and boys' underperformance in SSC and HSSC annual examinations. Table 8.1 gives an incisive summary of the factors of girls' outperformance in education. Some of these factors are similar to those revealed in literature skimmed for this study. These findings also shed light and adds some important factors to the existing boys of literature on girls' outstanding performance in education. For instance, the gendered socialization processes (make girls sensible and accountable), home environment, cultural norms (less mobility, lesser recreational and sports opportunities in evening), girls inferior position, self-motivation and family expectation encourage girls to be good in education.

Table 8.1 also summarizes the factors responsible for boys' underperformance. It is pertinent to mention here that majority of the factors of boys' poor performance come in odd with the factors previously examined in the context of the developed countries. However, these findings partially support the factors of developing world (see review of literature). The study's findings also add some new insight to the existing literature on the issue of boys' underperformance and girls' outperformance in education as demonstrated in table 8.1.

Chapter seven gave a detailed account of the causes of gender disparity in the academic performance with special focus to STEM subjects. The findings of the chapter support the arguments of feminists and cultural theorists. Based on the findings, it is stated that girls' underperformance in STEM subjects is rooted in the society and culture. Recent scholarships also support such views and do not accept essentialist and biological explanations (Cheryan et al., 2009; Eccles & Jacobs, 1986; Francis, 2000; Murphy, Steele & Gross, 2007; Pomerantz et al., 2017; Stout et al., 2011). A recap of boys' and girls' performance in STEM subjects is given in table 8.2.

Table 8.2

Factors of Boys and Girls Differential Performance in STEM Subjects

Boys' and Girls' Differential Performance in STEM Subjects
Factors
• Boys' and Girls' Performance in STEM: Culture Matters
• Boys and Girls in STEM: The Influence of Parents and Family
• Poor Quality of Teaching in Girls' School and Colleges
• Girls' Cramming Style of Learning
• Girls, STEM subjects and employment prospects
• Teaching Profession

The factors in table 8.2 are the important factors highlighted by study's respondents that influence boys' and girls' performance across different subjects. It is important to mention that these factors are entirely consistent with the factors of girls and boys differential performance in STEM subjects in developing and Muslim countries. Nevertheless, the study's findings add some important factors and insight to some of the aspect of boys versus girls in STEM subjects. Some of the striking factors that dampen girls' motivation and performance in STEM subjects are lack of trained and qualified female teachers in girl schools, stereotypes and culturally permissible career opportunities for girls.

8.2 Application of Theoretical Concepts on Data

This part of the chapter comprised of application of the various concepts on the data presented in chapter 5, 6 and 7. These concepts have been borrowed from theoretical and philosophical arguments of the scholars in the field of sociology of education and gender issues (see chapter 2 for detailed discussion).

I draw on the concept of observation and imitation. Observation and imitation play an important role in learning of the individual. It is pertinent to explain the concept of "role model" before engaging in discussion. Role model is a key element in learning through observation and imitation. Role models are people who have achieved success in a specific area and having influence on people. Role models are imitated and copied by people (Lockwood & Kunda, 1997).

In chapter 5, 6 and 7, the data are full of assertions that explain girls' and boys' performance across different subjects. For instance, girls' performance improved, along with an improved self-concept related to education. Girls today are exposed to their role

models that looked like them. In other words, girls are able to see females working as teachers and doctors which in turn inspire them and motivate them to study. Girls underperform in science related subjects such as physics, chemistry, math and engineering because there are no potential female role models in these fields.

Chapter 7 is full of evidences that explain reasons of boys' poor performance in humanities and their good performance in science subjects. Boys have role models in the field of STEM such as scientists, engineers, astrophysicists, computer programmers, and so forth. These live role models motivate and boost them positively in the field of STEM. They don’t have role models in the field of humanities, which are important for the development of their interest and ability in such fields. Thus, lack of role models for girls in STEM subjects strengthen existing stereotypes of STEM as a masculine terrain and having role model for them in the field of biology, arts and humanities-subjects labeled as feminine domains, which in turn influence boys interest in such fields.

The concept "reward and punishment" or "carrot and stick" approach are fertile concepts that give meaning to the findings of this study. Chapter 5 and 7 has the data, explaining how appreciation and encouragement works for girl to outshine in education. Girls today are getting appreciation (reward) and it boosts their performance in education. The data in chapter 5 illustrate that how parents' perception towards jobs in the field of arts and humanities encourage and motivate girls' interest in the said subjects. Similarly, chapter 7 consists of data that show that girls' underperformance in STEM subjects are linked with their lack of appreciation and motivation by family and culture. For example, girls are discouraged whenever they want to be engineers while boys are encouraged and appreciated when they express their interests to become engineers, pilot etc. This societal

and cultural appreciation reinforce boys and girls interest and performance in education differently. Thus, girls, when become doctors or teachers, are praised in society. On the other hand, they are not liked by society when they adopt profession in STEM fields traditionally considered as masculine domains. Boys are admired when they become engineer or software engineer. This gendered standard of reward and punishment pushes boys and girls in different fields.

The concept of sex-typed behavior is applied to the current data in the same fashion as it used by social learning theorists. Social learning theorists defines a behavior as sex-typed behavior when it is more expected and therefore seen as appropriate when performed by one sex, but less expected and, therefore, seen as inappropriate when per-formed by the other sex (Mischel, 1966). Chapter 7 gives rich information about the fact that how STEM subjects has been boys sex-typed and humanities fields have been considered appropriate for girls in our society. It is clear from the data that labeling STEM as a masculine field and humanities as feminine, influence boys' and girls' achievement in both mentioned disciplines. Girls do not consider themselves fit in STEM and boys in Humanities subjects due to this early categorization and making sex-typed as appropriate for one sex and inappropriate for other. For instance, beliefs about sex appropriate behavior are reflected in the expectation of parents and society. Based on this, I argue that such stereotypically labeling of sex typed behavior; society and culture undermine girls' ability and confidence from the outset in STEM subjects. This impoverishes girls' interest in STEM field which eventually leads to their failure in science related education.

In chapter 7, the data also show that girls underperformance in STEM and boys underachievement in Arts and Humanities are linked with the patriarchal nature of culture and family. Chapter 7 is full of the respondents' views that support the above claim. Using Kate Millett concept of the omnipresent nature of patriarchy, the chapter reveals that boys hegemony and dominancy in STEM fields and career badly impact and discourage girls urge to enter into STEM subjects. Patriarchy crates differences in masculinity and femininity that become the leading causes of girls' underperformance and lack of interest in STEM subjects. Drawing on this concept, it is argued that arts and humanities are considered soft subjects and considered appropriate for girls, which eventually diminish boys' interest and performance in arts and humanities.

The next concept to be used here is "other" used by the founder of modern movement of feminism Simone de Beauvoir. Chapter 7 has rich data related to girls' inferior and subordinate position in society. Using the concept of "other", it is argued that boys and girls experience different roles and positions in society that affect them differently in education. As per Beauvoir's concept of "other", it is clear that girls' engagements in activities and roles inside walls and homes impact and prevent them to join career outcome of STEM fields. It is important to mention that career is important factor in opting subjects. This means that girls' underperformance in STEM subjects is linked with their passive and subordinate position, with no distinct role of their own in life other than that of supporting man and his ambitions. Building on the de Beauvoir concept of "other", construction and characteristics of femininity in KP are in odd with STEM subjects. Man in such patriarchal society has made women the "other" in society. Having said this, it asserted that boys' and girls' have completely different choices in

society. Thus, it is evident that girls' underachieving in science related subjects is rooted in the gendered culture that set different choices and roles for boys and girls and making girls "other" of boys.

8.3. Implications of the Study

This study utilized quantitative and qualitative data for exploring the issue of gendered performance in SSC and HSSC annual examinations of BISE, Peshawar KP. By using quantitative and qualitative data, important understanding is obtained about girls' outperformance and boys' underperformance in education. The findings also provide insight into subject wise performance of boys and girls.

The findings of the study had the potential implications to improve and overcome the widespread gender disparity in the education performance. For example, the results of the study pointed out that boys' performance in education can be enhanced if they are given proper attention by their parents, having eyes on their activities including using of social media, free mobility and engaging in friends circles.

This study has also implications for designing interventions to increase boys' and girls' subject wise performance. For instance, boys think that careers associated with arts and humanities have no worth and respect in our society. The findings suggest that boys' performance in arts and humanities can be boosted by changing such mentality and pressure of society to be only doctors or engineers. The teachers and parents can play important role by educating boys' that every field has importance and application in society.

Similarly, the findings of the study propose that girls' performance and interest in STEM subjects can be improved by ensuring and providing equal opportunities and

environment for studying STEM subjects. Stereotypical beliefs about STEM subjects also affect girls' performance in science. It is important to encourage girls that they have the ability to read and learn STEM subjects. The findings also suggest that girls' ability in science can be dramatically improved if they are exposed to role models i.e. female engineer, mathematician and scientists. Wang and Degol (2013) mentioned in their study that female performance and interest has close link with role model. They asserted that role models are important to build self-efficacy which is important to build positive attitude towards science education. The study results, thus suggest that exposing girls to successful female engineers, mathematicians, programme developers, software engineers etc. can positively influence their interest and performance in STEM education.

Finally, teaching quality is needed to be improved in girls' school and colleges. Teachers are one who can motivate and encourage their students to engage in science and engineering. It is, therefore, important to recruit female subject in STEM fields at school levels. This will develop girls' interest from the very outset.

8.4 Recommendation for Future Study

The main focus in this research was on the causes of the differences in the academic performance of boys and girls in the SSC and HSSC annual examinations of BISE, Peshawar, KP. As this study was confined to urban center Peshawar, therefore, no attempt was made to give the causes and reasons of boys' and girls' differential performance in other regions of KP. Thus, a qualitative study needs to be conducted on the reasons of boys' and girls' performance in education in other regions of KP. In this research, the causes and understanding of girls' outperformance and boys' underperformance in education have been explored from teachers' perspective. In order to

have more comprehensive understanding of the issue in hand, it is recommended that the perspectives of parents and students need to be explored in future research studies.

In rural areas, there are evidences that reveal differences, favoring boys but no attempt is made to determine the reasons of this differences in the academic performance of boys and girls (Aslam, 2009; Shams, 2017). Thus, another possibility for future research is to explore the causes of girls' underperformance and boys' outperformance in rural areas.

The study has highlighted some important factors leading to girls' underperformance in STEM subjects in secondary and higher secondary levels. The students' interest in STEM has a close relation with his or her early education. I found in review of literature that the interest of student falls from one level to another. Based on this, I suggest further research to be carried out with comparative objectives. This might be beneficial in exploring key factors that influences particularly girls' interest and performance in science when they move from primary to middle schools.

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APPENDIX-I

Gender wise Result of SSC (BISE, Peshawar)

Year	Exam	Gender	Appeared	Passed
2002	10th	Male	74677	29053
2002	10th	Female	24412	13202
2003	10th	Male	34157	16096
2003	10th	Female	11679	7250
2003	9th	Male	23579	12743
2003	9th	Female	10106	7756
2004	10th	Male	29102	15172
2004	10th	Female	11169	6445
2004	9th	Male	26152	9089
2004	9th	Female	11515	5349
2005	10th	Male	27609	17839
2005	10th	Female	12422	8871
2005	9th	Male	29677	11349
2005	9th	Female	13287	6342
2006	10th	Male	29407	15599
2006	10th	Female	12041	7045
2007	10th	Male	38245	21887
2007	10th	Female	14154	9261
2008	10th	Male	38593	25831
2008	10th	Female	15143	11185
2008	9th	Male	33933	15594
2008	9th	Female	15652	9040
2009	10th	Male	31114	25052
2009	10th	Female	15130	12767
2009	9th	Male	40147	20636
2009	9th	Female	16484	10927
2010	10th	Male	36650	29717
2010	10th	Female	15932	13314
2010	9th	Male	42406	23478
2010	9th	Female	16831	11927
2011	10th	Male	39841	31663
2011	10th	Female	16717	13916
2011	9th	Male	44688	22995
2011	9th	Female	17988	11764
2012	10th	Male	41589	34571
2012	10th	Female	17854	15456
2012	9th	Male	45917	27338
2012	9th	Female	18352	13568
2013	10th	Male	43495	37903
2013	10th	Female	18171	16130

2013	9th	Male	48214	31133
2013	9th	Female	19451	14137
2014	10th	Male	47372	38431
2014	10th	Female	19142	16222
2014	9th	Male	49112	28993
2014	9th	Female	20715	14348
2015	10th	Male	47927	37732
2015	10th	Female	20283	16879
2015	9th	Male	50049	28107
2015	9th	Female	21237	14891
2016	10th	Male	49271	38811
2016	10th	Female	21104	17798
2016	9th	Male	51777	26072
2016	9th	Female	23182	15434

APPENDIX-II

Gender wise Result of HSSC (BISE, Peshawar)

year	Exam	Gender	Appeared	Passed
2002	1st year	Male	12820	5042
2002	1st year	Female	4822	2047
2002	2nd year	Male	13580	6118
2002	2nd year	Female	7185	3278
2003	1st year	Male	12690	6032
2003	1st year	Female	6463	3529
2003	2nd year	Male	14089	6842
2003	2nd year	Female	7236	3952
2004	1st year	Male	14966	5960
2004	1st year	Female	7624	3794
2004	2nd year	Male	15495	7414
2004	2nd year	Female	8021	4065
2005	1st year	Male	16453	6804
2005	1st year	Female	7625	4170
2005	2nd year	Male	16287	9921
2005	2nd year	Female	8802	5271
2006	1st year	Male	17386	8915
2006	1st year	Female	9108	6014
2006	2nd year	Male	18205	10712
2006	2nd year	Female	9089	5832
2007	1st year	Male	16796	10670
2007	1st year	Female	8097	6022
2007	2nd year	Male	19329	10995
2007	2nd year	Female	10212	6360
2008	1st year	Male	20188	12368
2008	1st year	Female	9304	6532
2008	2nd year	Male	20236	14273
2008	2nd year	Female	9475	6611
2009	1st year	Male	23395	14012
2009	1st year	Female	11167	8161
2009	2nd year	Male	22369	15090
2009	2nd year	Female	10562	7768
2010	1st year	Male	23272	12951
2010	1st year	Female	12124	8571
2010	2nd year	Male	25866	18339
2010	2nd year	Female	12441	9357
2011	1st year	Male	26542	17079
2011	1st year	Female	12676	9159
2011	2nd year	Male	26184	18854
2011	2nd year	Female	13247	10170

2012	1st year	Male	28707	17240
2012	1st year	Female	12837	9508
2012	2nd year	Male	29700	21671
2012	2nd year	Female	13955	10386
2013	1st year	Male	30661	18278
2013	1st year	Female	13598	10422
2013	2nd year	Male	32094	24517
2013	2nd year	Female	14216	11380
2014	1st year	Male	32858	18010
2014	1st year	Female	13810	11067
2014	2nd year	Male	32707	24345
2014	2nd year	Female	14712	11431
2015	1st year	Male	33439	15870
2015	1st year	Female	13471	10154
2015	2nd year	Male	34407	24524
2015	2nd year	Female	14786	11574
2016	1st year	Male	33931	17078
2016	1st year	Female	14450	10436
2016	2nd year	Male	34947	27080
2016	2nd year	Female	14222	12084

APPENDIX-III

1. Age _____
2. Gender a) Male b) Female
3. Qualification of the respondents_____.
4. Profession_____
5. Which subject do you teach? _____
6. How long have you been working as a teacher?
7. Have long have you been checking papers_____
8. What are the changes have you observed in boys and girls educational performance in SSC and HSSC examination over the last one and half decade?
9. Who among boys and girls performed better in education and what are the factors of their outperformance?
10. Who among boys and girls underperformed and what are the reasons of their underperformance in education?
11. How will girls' outperformance in education will replace men dominancy in the public domain?
12. How will this change in the education performance of boys and girls make cultural panic in the future?
13. How the change in the educational performance of boys and girls will affect the economic and social arrangement of our society?
14. Why do girls and boys performance differ in Science and Arts/Humanities subjects?
15. What measures are put in place to eliminate gender difference in the academic performance?