



Girls in Science and Technology Education: A Study on Access, Participation, and Performance of Girls in Nepal



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Preface

In Nepal, girls started taking part in school education of late. And, those who enrolled in schools would usually come from the rich family, high caste community, city centers, district headquarters and road corridors. But with the passage of time, this trend slowly changed and the girls from the disadvantaged communities and locations also started showing up in schools. Thus, most of the girls were first generation schoolers. During the course of educational expansion, girls witnessed both conducive as well as obstructive forces to the promotion of their education. As revealed by the studies carried out so far in the country, only some of the forces were found conducive to girls' education and most of them were obstructive. To address these problems, these studies have suggested various socio-cultural, economic, and educational measures.

This study differs from the earlier studies in that it has extensive coverage, balanced focus on both conducive and obstructive forces to the promotion of girls' education, and developed an action plan to implement the suggested measures to ensure their access to and participation in STE subjects.

Many people contributed to bringing this study report in the present form. School authorities provided data about their students and teachers, while head teachers, teachers of science and technology subjects, girls, boys, and parents shared their valuable experiences and views during the field visits. In the district headquarters, the District Education Office authorities helped field researchers find out the sample schools, collect data and tabulate the information obtained from different sources. Similarly, policy makers, planners, STE related curriculum developers, implementers, and teacher trainers also shared their precious views and experiences. All the people who in one way or another helped generate information for the study deserve our heartfelt thanks.

Some individuals put in their efforts to review curricular materials, while others helped in analyzing the data, qualitatively and quantitatively. They deserve our special thanks.

Participants representing different fields associated with girls' education and gender equity also put across their views and experiences and helped finalize the workplan. We highly appreciate their valuable contributions. Advisory team members, without whose help the report would not have come in the present shape, also contributed their valuable inputs from time to time and reviewed the report. Our thanks go to them also for the time they expended and comments made.

Officials of the UNESCO Regional Office always remained helpful throughout this study. Ms Koto Kanno, UNESCO representative to Nepal, for her academic support and Ms Sohae Lee, associate expert at UNESCO Kathmandu Office, for her logistic support deserve our special thanks.

Finally, we are indebted to Ms Julia Heiss of UNESCO Paris for entrusting us to undertake this study. We are equally grateful to the UNESCO authorities for providing financial support for the study.

Principle Researchers

Acronyms

ARNEC: All Round National Education Committee

BPEP: Basic and Primary Education Program

CDC: Curriculum Development Center

CERID: Center for Educational Research, Innovation and Development

CTEVT: Council for Technical Education and Vocational Training

DEO: District Education Office

DOE: Department of Education

EFA: Education For All

GEDS: Gender Equality Development Section

GPI: Gender Parity Index

HSEB: Higher Secondary Education Board

I/NGO: International & national non-government organization

IP: Indigenous People

MDG: Millenium Development Goals

MOES: Ministry of Education and Sports

NCED: National Center for Educational Development

NESP: National Education System Plan

NHLEC: National Higher Level Education Committee

NNEPC: Nepal National Education Planning Commission

NPC: National Planning Commission

PRSP: Poverty Reduction Strategy Program

RC: Resource Center

RP: Resource Person

SED: Secondary Education Division

SEDC: Secondary Education Development Center

SEDU: Secondary Education Development Unit

SESP: Secondary Education Support Program

SLC: School Leaving Certificate

SMC: School Management Committee

STE: Science and Technology Education

TU: Tribhuvan University

WES: Women Education Section

Executive Summary

Context and Study Process

This study was undertaken essentially to achieve four objectives, viz. to review curricular and research materials from gender lens, identify stakeholders' perspective towards girls' access to and participation in Science and Technology Education (STE) related subjects, find out the forces that are both conducive as well as obstructive to STE for girls, and work out measures to address the problems. In view of these objectives, documents were reviewed, 55 schools in 11 districts of the country surveyed and data of 80,838 students analyzed quantitatively. This apart, qualitative information obtained from 22 different schools of the districts was processed, classroom dynamics was observed, and case studies were carried out. The data thus obtained from the fields were shared through debriefing sessions in the headquarters of the districts covered by the study. Altogether 16 people were directly involved in the study, 11 of them in gathering field data and the rest in reviewing curricular materials, analyzing data and writing report. All eight members of the study advisory team and the researcher from UNESCO Paris reviewed the report. And, a national workshop provided necessary input to finalize the STE work plan.

Documented Findings

Review showed that school incentive and parental education program, provision of female teachers in schools, gender sensitization training and gender auditing of the existing curriculum were the major programs to ensure girls' access to and participation in education. But no STE-specific policy for girls was found in place. Literature review, on the other hand, had focused more on finding out the obstructive forces for girls' education such as parental unawareness, socio-cultural values, gender biased teaching-learning environment and economic hardships of the parents.

Field Findings

The three-week field study has identified many conducive factors for STE. They are: (a) social recognition of girls' education by their parents (b) heightened career hope of the girls (c) back-up given by the teachers and parents and presence of role model females in STE field in the vicinity (d) occasionally organized STE exhibitions (e) support from parents, teachers and colleagues to learn STE subjects (f) tutorial support (g) girls' exposure to STE subjects (h) competitive environment in school, and (h) provision of scholarship/incentive or rewards for best-performing girls.

Similarly, the study also identified the forces standing in the way of STE learning. These forces were: (a) socio cultural values of the community (b) teachers' stereotypical notion about girls' aptitude (c) girls' inhibition to be interactive in STE subjects (d) agrarian life style and/or abject poverty (e) grace marks sought by parents and given by the teachers (f) gender-biased attitude of male students towards girls (g) non-friendly classroom setting or seating arrangement in school (g) inadequate access of girls to STE labs and libraries, and (h) low career options for girls.

Gender Gaps

Gender gaps were apparently reflected in school attendance, achievements and pass percentage. For example, girls attended school less than boys. But they scored better in

population and environment subjects and in lower grades. The Terai girls, however, could not maintain this trend and lagged behind. An analysis based on caste composition showed no definite pattern in girls' attendance. Girls obtained more score in the less demanding STE subjects than in more demanding ones. Interestingly, more girls obtained higher pass percentage than boys. Similarly, girls of the higher caste (Brahman) and ethnic group (Newar) scored more than the girls from so-called lower caste (*Dalit*) and *Janajati* or nationalities.

In Mathematics, girls were identified to have found algebraic formulae and geometry more difficult and hence obtained low scores than boys. The Terai girls were low scorers in Mathematics among the students. But the study found the girls scoring equal to that of boys in Computer education. In some cases they were even better. Brahman and Kshatri girls surpassed others and it was particularly true of the girls of the Kailali district. In the lower grades, girls obtained better scores in Science but in higher grades they lagged behind. Terai and *Dalit* girls, in particular, remained low scorers. And the girls of Kaski district could obtain better score among the girl students but failed to exceed their male counterparts. Girls in the lower grades obtained and maintained higher score in health and physical education but they, too, remained low scorer as they went higher up. Interestingly, *Dalit* girls remained high scorer in these subjects.

Gender gaps persisted in the pass percentage as well. Girls' pass percentage, for instance, remained high in the lower grades and the trend reversed as they reached the higher grades. But the case was different with *Dalit* girls who always obtained low pass percentage as compared to boys.

Conclusion and Measures

The study came up with five major conclusions, which are: (a) parents expected less from girls' education and so cared less about it (b) teachers failed to link girls' practical experience with theoretical knowledge (c) girls were confined to domestic chores and hence could not give enough time to STE subjects (d) girls fear that STE subjects are difficult considering it as the boys' domain only (e) girls' deeply entrenched inhibition stood in the way despite efforts to the contrary.

In order to ensure girls' access to and participation in STE, some measures were worked out. They include pedagogical change, tutorial support, development and distribution of model females' rosters, interaction between teachers, parents and students, gender sensitization, incentive, lab and library support, collegial monitoring and counseling, and project work to accommodate practical experiences of the girls. These will contribute to making STE subjects more enjoyable.

Besides, the study has developed an action plan to address the STE specific issues, identified action strategies and pointed out the responsible agency to implement intervention initiatives. These intervention initiatives include actions as well as programs to address socio-culturally oriented gender biased mindset, school based encouragement scheme for girls and those advocating girls' education, school support program, and STE career expectation programs for girls.

Table Of Contents

Chapter I	Context and Study Process	13
	The Context	13
	Objectives	14
	Study Process	14
Chapter II	Review Of Literature	22
	Policies and Programs Related to Education of Women and Girls	22
	Growth in Girls' Enrolment	23
	Assessment of Curricular Materials	25
	Research in Girls' Education	29
Chapter III	Promoting Forces in Girls' Access to and Participation in STE	30
Chapter IV	Hindering Forces in Girls' Access to and Participation in STE	35
Chapter V	Gender Gap in Achievement	41
Chapter VI	Major Findings, Conclusions and Measures	61
	Conclusions	62
	Gender Equality Measures	63
References		71
Appendices		72
	Appendix 1 Method, Tools, Respondents, and Expected Outcomes of the Study	72
	Appendix 2 Dalit/Ethnic Groups of Nepal	74
	Appendix 3 Female/Male Ratio by Educational Attainments and Ethnicity\Caste	75
	Appendix 4 Promoting Forces For Girls' and Women's Access to Education	76
	Appendix 5 Hindering Forces for Girls' Access to and Participation in STE	79
	Appendix 6a Level and Subjectwise Analysis of the Primary Level Curriculum	82
	Appendix 6b Gender Sensitivity Analysis of Textbooks	91

Appendix 6c	Gender Sensitivity Analysis of Teaching Manuals	109
Appendix 6d	Gender Sensitivity Analysis of the Curriculum	115
Appendix 7	Gender Gaps in School Enrollment	121
Appendix 8	Gender Equality Measures Envisaged in Different Documents	122
Appendix 9a	Gender Gap/Pass Percentage Population and Environment Education	127
Appendix 9b	Gender Gap/Pass Percentage of Mathematics	128
Appendix 9c	Gender Gap/Pass Percentage of Computer Education	129
Appendix 9d	Gender Gap/Pass Percentage of Science	130
Appendix 9e	Gender Gap/Pass Percentage of Health and Physical Education	131
Appendix 10	Scores of Girls and Boys by Grades	132
Appendix 11	List of the Schools Studied	137
Appendix 12	Research Team	139
Appendix 13	Advisory Team Members	139
Appendix 14	Participants of the Workshop Thematic Groups	140

Chapter I Context and Study Process

The Context

Girls' access to quality education and equity of opportunity, and selection of subject matters suitable to them have become a matter of national and international concern over the years. Millennium Development Goals (MDG) and Education for All (EFA) at the international level and development plans, the Secondary Education Support Program (SESP) initiatives, EFA national documents, and NPC documents at national level have developed strategies and programs with a view to addressing those concerns. However, many programs targeting girls in general and the girls from marginalized communities in particular fall short of achieving the expected results. Girls' scholarship can be taken as a case in point, which, beyond doubt, to some extent, contributed to increasing girls' access to and retention at primary level but failed to ensure their continuation in higher grades as expected. Gender disparity in primary education is found at 12 percentage point in terms of NER (boys' 87% and girls' 75%). The total enrollment of girls stands at 44.8%, 42% and 41.4% in primary, lower secondary and secondary levels respectively. These figures stand as testimony to gender disparity in school education. The estimated differential access of girls to primary school (*Dalits*' 30%, indigenous peoples' 50%, and overall girls 44.8%) and similar disparities in lower secondary and secondary schools provide yet another example of girls being discriminated and marginalized (Source: MOES, 2000; 2003; 2004).

With a view to addressing the above situation, UNESCO has been working in the field of education over the years. Children's education, especially that of women and girls, is its prime concern. In line with this concern, UNESCO sponsored this study with six major aims in mind. First is to support EFA initiatives. Second is to address PRSP. Third is to take a step towards promoting science and technology education for the 21st century girls of developing nations. Fourth, this is a response to meet the growing needs of STE knowledge and skills in everyday life of the people. Fifth is to make people, especially policy mandarins and those who are associated with implementation, aware of gender issues in the field of STE. Sixth is to build capacity of the researchers of member states. In this context, UNESCO Paris sponsored this research project in four countries simultaneously, namely Nepal, Egypt, Burkina Faso and Argentina.

In Nepal, little attention has been given to the study and understanding of gender issues in the context of science and technology education. Although an obvious gender gap exists in both performance and access to STE, no comprehensive analysis on gender and science education in Nepal is found to have been undertaken yet. This study, thus, is intended to understand the factors that promote and hinder girls' access to and participation in science and technology education from primary to secondary school levels in the country, to provide a sound basis for future programs and devise measures to achieve gender equity and equality in the field. Currently, the school curricula provide Math, Science, Environment Education, Health and Physical Education from grade I to X either in an integrated way or separately. The weight and design thus vary according to the grade level. However, in grade IX, students are allowed to select an extra subject from the optional group which includes Math and Computer Science,

among others, in addition to other non-STE subjects. The students continue studying the selected subjects till grade X final exams, which is School Leaving Certificate examinations, shortly known as SLC. In this study, STE includes *Science, Mathematics, Computer Education, Health and Physical Education, and Population and Environment Education*. The last two subjects have been included in STE because most of their concepts and topics are based on pure science.

Objectives

The main objective of this study is to understand and identify the gaps and needs in the STE system in order to provide a socio-culturally relevant gender-inclusive STE for all children. The specific objectives as follows:

- To review EFA Plan of Action, STE policies, curricular materials and teaching environment from a gender perspective,
- To understand attitudes of different stakeholders of education (planners, teachers, students and parents) towards girls' access, participation, ability and choices with regard to STE,
- To identify conducive and obstructive forces to the promotion of girls' access to STE, and
- To propose measures for improved access and participation of girls in STE.

Study Process

The study comprises five components, viz. document review, school survey, qualitative study, case study and participatory workshop. A theoretical part based on secondary data collection on STE was completed with an empirical survey conducted in schools to understand attitudes and behaviors of teachers and students, and to assess the impact of teaching environment, such as teaching methods and choices and performance of girls. These components are briefly discussed below:

Document review/survey: Policies, project reports, curricular materials and related literature were examined. The purposes of the document review/survey were:

- To obtain gender disaggregated quantitative data on the enrolment and achievement pattern in STE from primary to higher education,
- To evaluate gender sensitivity of the school level STE related curricular materials,
- To obtain information about the socio-cultural context of the girls from ethnic, religious, and caste groups through the review of previous researches and documents,
- To formulate the guiding research questionnaires for the school survey and empirical study.

School survey: Five schools from each of the 11 selected districts were surveyed (see sampling plan) and the student records of three consecutive years were scrutinized. The purposes of the survey were:

- To assess the performance rates of girls and boys from different ethnic and caste backgrounds in STE from grade IV to XII,
- To find out the percentage of girls selecting STE as optional subjects in grade IX,

- To identify girls' family background (e.g. ethnic/caste/religious, parental education, family economy), and
- To identify schools for empirical study

Altogether, 80,838 students were entered in the data sheet in EXCEL. Tabulation was done by using SPSS 10 and Vfoxpro 6.2.

Qualitative study: Two schools from each of the 11 selected districts were identified for qualitative study (Table 1). This study concentrated on qualitative aspects of STE. In the course of this study, STE classes were also observed to find out the factors responsible for promoting or hindering girls' access to and participation in STE. The empirical study aimed to explore and understand:

- School learning environment,
- Classroom activities, pedagogies and evaluation processes,
- Teacher-student relationship,
- Dynamism among male and female students,
- Orientation or counseling process (peer, teacher, parents, senior student), and
- To tabulate the information obtained from general survey.

Field researchers in consultation with the head teachers and subject teachers observed the classes, took down field notes on what they observed, shared their observation with the teachers concerned and obtained teachers' opinions for authenticity of the observed data. On average, three days were spent for class observation in each of the schools chosen for in-depth study.

Case study: Two case studies of the best and worst performing girls of each school where qualitative information was sought were carried out. Field researchers identified those girls during the course of the in-depth interview. After their identification for the case study, the field researchers visited the houses of the girls, discussed with their parents and friends, and cross-checked the information thus obtained with the girls concerned. The purpose of the study was to derive more detailed and in-depth information about the circumstances and situations that would favor or deter girls in the pursuit of STE. The specific purposes were to explore and understand:

- Socio-cultural forces that promote or hinder girls' access to education in general and STE in particular,
- Parents' attitudes towards girls' participation in science and technology,
- Teachers' attitude with regard to girls' abilities and skills in science and technology,
- Girls' own views and interests in science and technology education, and
- School environment that promotes or hinders girls' access to and participation in STE.

The draft report was circulated to the advisory team members, project coordinator from UNESCO Paris and personnel from UNESCO Kathmandu for their comments and suggestions. All advisory team members and others who reviewed the draft report were experts in either gender or science education. The purpose of the review was, therefore, to fine-tune the report in terms of data presentation, consistency, legibility and formatting.

Workshop: A one-day workshop was organized at the central level after completing the survey/study. The purposes of the workshop were:

- To disseminate the survey/study results,
- To collect feedback from participants to improve the STE workplan,
- To sensitize EFA implementers and STE related central level stakeholders on the need of providing relevant and gender inclusive STE,
- To develop a partnership strategy aimed to ensure girls' participation in and access to STE by involving a wide range of participants in the workshop.

The workshop was divided into two parts. First was the inauguration session covering speeches by both the full and the State ministers of Science and Technology, and the secretary of MOES. Second was the workshop in which about thirty five people participated. The participants comprised teachers, teacher educators, policy makers, implementers, educational bureaucrats, school and college students (women), and field researchers. They were briefed about the outcome of the study and divided into six different thematic groups (Appendix 14). The group members discussed the proposed STE support action plan and came up with an agreed conclusion. The group reports were shared and discussed at the plenary session. The session was chaired by Prof. Govinda Sharma Ghimire, Dean of the Institute of Science and Technology, Tribhuvan University (TU). The information thus gained has been incorporated in this STE report.

Study team: Sixteen people were directly involved in the study team (Appendix 12). Eleven of them including three females worked as field researchers. It is they who surveyed the schools to gather quantitative data, conducted group discussions and interviews to generate qualitative data, and gleaned different cases from the fields. Ms Sashi Aryal collected STE related documents, made notes on them and helped in developing study tools. Similarly, Ms Puspa Ghimire analyzed STE related curricula, textbooks and teachers' guides of grades 4 to 12 from gender lens. Similarly, Mr Harihar Nath Regmi analyzed the quantitative data in EXCEL by using SPSS and Vfoxpro. And, principal researchers Dr. Bidya Nath Koirala and Dr. Sushan Acharya prepared the report. The research team was supported by the advisory team members (appendix 13).

Sampling plan

The study team went through ethno/caste-demographic data of the country. Based on the data, districts with overwhelming population of ethnic/caste groups were identified (Gurung, 1998) and districts for sampling marked. The districts are given in the following Table. While so doing, topographical division of the country, viz. hill, mountain, plain and valley was also represented.

Table 1
Study Districts and their Dominant Ethnic/Caste Demography

	Districts and Ethnicity				No. of Districts
Mountain	Doti (Kshatri)	Rasuwa (Tamang)	Mustang (Gurung)		3
Hill	Kaski (Bahun)	Palpa (Magar)	Ilam (Rai)	Panchthar (Limbu)	4
Plain	Siraha (Yadav)	Banke (Muslim)	Kailali (Tharu)		3
Kathmandu Valley	Newars of 3 districts, viz. Kathmandu, Lalitpur and Bhaktapur				1
Total districts					11

NB. The information given in the parenthesis covers dominant caste/ethnic groups (appendix 2).

Girls constituted the subject of analysis for this study and a multi-stage sampling process was applied to reach them. Following this process, in the first stage, the districts were identified to cover girls of major ethnic and caste groups. In the second stage, 55 schools, five from each of the study districts, were identified for survey and two out of five schools were identified for the empirical study in each district in consultation with the concerned DEO. In the third stage, girls from the two selected schools were individually interviewed and consulted in groups for qualitative information. They were identified in consultation with teachers and head teacher of the studied schools.

Accessible stratified sampling (co-ed school, single sex school and student composition) approach was used to gather the data from the school. Altogether 55 schools, five from each district, were surveyed. Depending on the availability of researchers and in view of the security situation, school teachers, non-teaching staff and local researchers were mobilized to collect quantitative data from the schools. But the field researchers monitored the data collection processes. They were, in turn, monitored by the senior researchers through telephone or other means.

Each of the field researchers visited two schools to gather qualitative data. They spent at least a week there. During this period, they took interviews, organized focus discussion sessions, observed classes and took notes. The Table 2 presents the number of consulted girls and boys for data collection.

Altogether 11 field researchers, three of them women, were mobilized for data collection. Before going to the field, they were thoroughly briefed about the tools to be used, school sampling techniques, data collection process, data tabulation process and data editing for two days. Besides, they were given necessary inputs through telephone and fax when they were in the field. Once the researchers came back to Kathmandu upon completing their field work, three additional days were given to edit the field data. In all, 24 days were devoted for data collection and editing.

The quantitative data were computerized and the qualitative data were manually treated by classifying them into themes and sub-themes. The data thus gained were scrutinized, analyzed and interpreted from different perspectives including economic and gender lenses.

Table 2
Number of In-school Respondents Consulted for Qualitative Information in One District

Particulars about interview	No. of girls/boys respondents	No. of respondents per school	No. of respondents per study district	Total No. of respondents
Four group interviews with girls from grade V to XII	Five girls in each group	20	40	440
In-depth interview with girls	One girl from each group (i.e. four girls)	4	8	88
One group interview with boys	Five boys in a group	5	10	110
Total		29	58	638

Regardless of the ethno-demographic information of the study districts, girls of other caste/ethnic background appeared in the sample. In this case efforts were made to (a) bring information about the dominant caste/ethnic groups of the district (b) derive information about *Dalit* girls, and (c) gather information from physically as well as mentally challenged girls. During the study, the head teachers, STE teachers and parents from all the schools were thoroughly interviewed. The Table 3 presents the number of respondents who were further consulted for qualitative information.

Table 3
Other Respondents Interviewed for Qualitative Research

Respondents	Total
Head teachers	22
Teachers	65
Parents	60
CDC	3 (STE curriculum expert/in charge)
SED	3 (STE curriculum expert/in charge)
SEDU	1 from each SEDU (5)
NCED	3

Debriefing Session

Field researchers gathered both qualitative as well as quantitative data. After all the data were gathered, they were reviewed and presented in a district level workshop. The workshop participants were invited from the DEOs and those who in one way or the other were related to children's education. The debriefing session helped tabulate the data that were obtained from

the field. Besides, the session also updated the knowledge of the district level education authorities.

Study Tools

There were three sets of tools employed, viz. survey forms, interview guidelines, and observation guidelines for data collection. The basic coverage of the tools has been given in the initial outcome section of the methodological nutshell of Appendix 1. These tools were tested in four locations of the districts of Rasuwa and Rupandehi and of Kathmandu valley for a week. Taking into consideration the findings of the test, the tools were revised and finalized.

Though most information collected by applying the above tools cross-matched, there were some instances where information did not match. For example, data obtained from the quantitative sources showed no difference in the attendance of the girl and boy students. But, contrarily, the qualitative data showed the other way round. It revealed that girls are more absent in schools by reason of them being more constrained by cultural and domestic activities than their male counterparts. In such situation, either the lived context the girls were actually in were described or the ethical questions regarding the data source were raised. Thus, the data obtained from the fields were tabulated by (a) tools to tools matching (b) researcher to researcher matching (c) describing the lived context of the girls, and (e) raising the ethical questions associated with the data source.

About a decade ago, the Communist Party of Nepal (Maoist) declared the “people’s war” to replace the “old regime” by its “new regime.” Because of the physical and/or “shadow presence” of the Maoists (Roka, 2004), both the potential and kinetic stakeholders of education in rural and remote areas have been terrorized. There are cases of teachers and I/NGO people being forced to pay the Maoists. Besides, they were supposed to follow what the Maoists would dictate them to do. This study was conducted in such an atmosphere full of uncertainty and fear. Moreover, there were frequent *Bandhs* (or strikes) during the data collection period. As a result, means of both public and private transport stayed off the roads and the schools remained closed in some places. In some districts, students were also in their term exam. In spite of such difficulties, the field researchers dared gather the data, qualitative and quantitative, in the ways given below:

Table 4
Issues and Measures to Gather Data

Issues/Problems	Field Researchers’ Measures to Gather Data
Some of the sample schools were closed because of the Maoist <i>bandh</i> (strike)	The field researchers waited until the Maoists called off their <i>bandh</i> . School teachers cooperated with the field researchers to find respondents. Some students were friendly enough to provide their generous help to the field researchers.
Field researchers encountered the Maoists	The field researchers kept themselves silent before the Maoists. They lied to the Maoists by saying that they were collecting data for their Master’s Degree thesis with the support of UNESCO.

Some field researchers were scared	They took with them teachers or supervisors as helpers or research assistants. They also hired locals as research assistant and/or helping hand.
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Definition of the Terminologies

- (a) *Cultural capital*: Borrowed from P. Bourdieu (1991). This terminology is used to convey the message that there is no culture of supporting girls' education in some ethnic and caste groups, while it is present in others. In other words, the cultural practice can be changed into economic capital that encourages girls to take STE subjects. For example, educated parents provide a culture to their daughters- a culture that supports girls to learn STE subjects more. This practice is termed as cultural capital that goes in favor of girls' education.
- (b) *Ceiling*: John Ogbu (1978) used this term to describe the level of expectation of world's minorities. The word 'ceiling' here stands for expectations of parents and girls from education.
- (c) *Domesticated*: This word is borrowed from P. Freire (1970) and conveys the meaning that parents want their girls to be suitable for household chores and traditionally accepted roles in family life. The word also implies that even the girls foresee their future that way.
- (d) *Social construct*: This word is rooted in the Vigotsky's concept of constructivism. In pursuance of this concept, the word 'social construct' describes the socio-cultural composition of knowledge about girls and their education. Similarly, the phrase 'equity construct' is used to indicate the egalitarian approach where men's and women's fields of work are not distinctly separated. Similarly, the phrase 'equivalent construct' indicates men's and women's different fields of work but they are considered as equivalent and not equal. Besides, the phrase 'gender construct' is interchangeably used for equivalency construct where women have different fields but are equally valued for men's work.
- (e) *Ethnomathematics*: Borrowed from the constructivists' knowledge, the word ethnomathematics has been used here to indicate the mathematics that exists with the community people. This mathematics is usually neglected by the STE teachers. For example, the Tamang ethnic group of Nepal has its own system of counting up to 20. In other words, they have to count 1 after each 20. But, in schools, the Tamang girls are supposed to count 21 after 20 which does not exist in their ethnomathematics. The same is applied to the teaching of science also, and cultural science here is known as ethno-science.
- (f) *Academic year*: Nepal has four calendars, viz. *Bikram Sambat (era)*, *Nepal Sambat*, *Saka Sambat* and Christian/Western Calendar. But for official use we use Bikram Era which is 56 years, 8 months and 14 days ahead of the Christian or Western Calendar. In this study as well, we have used Bikram Sambat which normally commences in mid-April.
- (g) *Lived experience*: This word is borrowed from the interpretive thinkers and has been used in this study to describe the experiences of the girl students and their parents.
- (h) *Less and/or more demanding subjects*: Subjects like social studies demand less time of the girls, while the subjects like Mathematics and science require more time to master them. Besides, society values Science, Math and technical subjects more than the subjects of the

humanities discipline. The words 'less demanding and more demanding subjects' are used in this sense.

Delimitation and Limitation of the Study

The study has delimited its area. Its limitations are as follows:

- The curriculum reviewer delimited herself in the sense that she did not focus on content weightage and coverage of the curricular materials including textbooks. She reviewed presentation of the subject matters from gender lens.
- The quantitative data obtained from the field are presented by using the mean score to compare the performance and attendance of the boys and girls. However, there are some bar charts to show the differences.

Chapter II Review of Literature

Three types of literature were reviewed. The first type of literatures were those that examined the policies and projects related to girls over the period. The second type included curricular, co-curricular and extra curricular materials from gender lens. And, the third type of literature included those that have examined girls' status in socio-religious contexts. The following paragraphs present the review reports.

Policies and Programs Related to Education of Women and Girls

Nepal has three major groups of people, viz. caste group of the Hindu community, ethnic group of the Buddhists and Kirat community, and Muslims. Within the different religious, ethnic, and caste groups, the ways of looking at women and girls vary as a result of which their roles and status also differ. Irrespective of the differences in roles and status, women's literacy rate across the groups is almost half of their male counterparts (Appendix 3). Education and development plans were examined against this backdrop to work out gender justice approaches in education. The following Table presents a cursory glance of the efforts made so far in women's and girl's education.

Table 5
Examples of Educational Policies and Programs Geared Towards Gender Justice

Education Plan/Commission Reports	Policy Intent	Proposed Programs
NNEPC, 1955	To improve women's skills and knowledge to enable them to better perform their traditionally assigned roles.	Adult literacy
ARNEC, 1960	<ul style="list-style-type: none"> o Continuation of NNEPC policy with inclusion of community development and basic needs components. o Both girls and boys shouldn't be deprived of primary education. 	<ul style="list-style-type: none"> o Adult literacy o Expansion of primary schools.
NESP, 1970-75	No segregated schools.	Co-education
NHLEC, 1992	<ul style="list-style-type: none"> o Increase women's literacy o Women and girls are given priority at all levels of education o Priority is given to women in teacher training o Provision of scholarships for women and girls 	<ul style="list-style-type: none"> o Literacy and/or education for women for their empowerment o 70% of scholarships to women
EFA document 2002 - 2015	Gender mainstreaming Preparation of teachers to be gender sensitive and socially inclusive	Gender training for head teachers, teachers, and SMC members
Tenth Five-Year Plan (2002 - 2007)	Special provision for girls in education	Scholarship and free textbooks for the girls studying in lower secondary and secondary schools

Education Plan/Commission Reports	Policy Intent	Proposed Programs
MOES Policy 2059/2060	Provision of at least two lady teachers in each school	Ten months pre-service training with scholarship for potential women from the ethnic groups and <i>Dalits</i>

Sources: Gayatri Timsina, 2004 and MOES documents

The Table above shows a gradual change and evolution of policies which also reflect the social cultural context of the given time with regard to women and girls. Despite the provisions for affirmative action in favor of girls' and women's education, co-education, scholarship support, parents awareness, dress distribution, stationary support and free textbooks distributions, there are still some questions to be taken into account. Do male students view females as their equal? Have these concepts and programs been institutionalized? Are all the girls and women eligible to get these support except textbooks? Are all parents reached with awareness programs? The answer to these questions is "no." However, it cannot be denied that progress has been made towards gender parity in education. Currently, in Nepal, the Gender Parity Index in primary level net enrollment ranges from 54% in Mahottari district to 119% in Sindhuli. Similarly, the GPI of overall school level (1-10 grades) net enrollment ranges from 55% in Rautahat to 105% in Sindhupalchowk.

In order to cross-check the provisions laid down with the operational reality, efforts were made to gather information from the policy and implementation level personnel as well. The persons interviewed were from the Planning Division of the Ministry of Education and Sport (MOES), the Curriculum Development Center (CDC), the National Center for Educational Development (NCED), and the Secondary Education Support Program (SESP). According to them, there is no STE specific policy for girls. However, NCED has introduced gender sensitization contents in its teacher training curricula and packages. It is also encouraging that the SLC pass female students from the *Dalits* and ethnic groups are provided with special opportunity through ten months' pre-service teacher training program to become teachers at primary level. CDC, on the other hand, has been developing a curriculum framework and reviewing its existing curricula from different lens including gender. HSEB is also reviewing its curricula and SESP has been promoting need-based training for teachers. Moreover, the EFA document has made arrangement for life skill education that in one way or the other helps girls understand the STE subjects. This implies that as the programs mentioned in the Table above have already been implemented, they could have an indirect impact on girls' access to and participation in STE subjects.

Growth in girls' enrolment

Girls' enrollment has increased over the years, showing a growing awareness of parents towards girls' education. The Table below presents the growth in girls' enrollment in schools over a period of three decades in Nepal.

Table 6
Increase in Girls' Enrollment in School

Year	Primary			Lower Secondary			Secondary		
	Total	Girls	Girls %	Total	Girls	Girls %	Total	Girls	Girls %
1973	301439	49234	16.3	157709	24298	15.4	58484	10580	18.1
1983	1626437	454884	28.0	219609	50171	22.8	198482	40870	20.6
1993	3091684	1195930	38.7	637367	216468	34.0	272747	83927	30.8
2003	4025692	1827587	45.4	1210059	527688	43.6	511092	223939	43.8

Source: DOE/MOES, 2004

Table 6 indicates that girls' school enrollment has increased over the years. But, though not reflected in the above Table, girls from some groups such as *Dalits* and ethnic communities have never been to school. Moreover, not all who are enrolled make their way up to secondary level and those who actually make it find the subjects traditionally considered as women's such as home science, literature and social studies easier than the subjects related to science and technology. This scenario raises the question why girls are not interested or show a lack of interest in the subjects like science, mathematics and technology. This study basically lays focus on this aspect.

Studies conducted so far in the country show that though more girls are enrolled in schools, their achievement has been relatively low in all STE related subjects in comparison to their male counterparts. Table 7, given below, presents the general tendency of student achievement.

Table 7
Students' Achievement in Different Subjects

Studies	Subjects	Lower Secondary Level		
		Grade 4	Grade 6	Grade 8
CERID/BPEP, 1999	Math		44.4	28.87
	Science		38.59	29.62
	Nepali		56.38	68.80
	English		43.6	34.29
EDSC, 1997	Math	28		
	English	49		
	Environment	42		
		SLC examination		
SLC at a glance (2059/2002)*	Math		28.2	
	Science		25.9 (out of 75 marks)	
	English		27.8 (out of 80 marks)	
	Population & Environment		38.2 (out of 75 marks)	

*Indicates the average marks obtained in core subjects

The Center for Educational Research, Innovation and Development or CERID's study on the achievement of grades VI and VIII from a gender perspective revealed that the mean achievement score of girls (58.4) was higher than that of boys (54.81) in Nepali in grade VI. However, mean achievement of girls in Science, Math and English of the same grade was

slightly lower than that of the boys. Similar is the case with grade VIII also. Girls' mean achievement score (69.4) in Nepali was higher than that of boys (68.30). Like in grade VI, girls' mean achievement scores, in grade VIII also, in Science, Math and English were lower than that of the boys (CERID/BPEP, 1999).

An analysis of the data in question shows four trends. One, overall achievement of the students, whether boys or girls, is poor. Two, girls are always low achievers generally in all subjects and particularly in STE subjects. Three, girls obtained relatively better score in non-STE subjects. Four, girls' achievement is either near or below average. This situation of low achievement among girls, particularly in STE related subjects, demands further investigation. In this context, efforts were also made to examine the curricular, co-curricular and extra curricular materials to find out the level of gender sensitivity in them. The following paragraphs display the result of the review of curricular materials.

Assessment of Curricular Materials

Nepalese society is composed of "gender biased" social constructs where duties of men and women are culturally prescribed. This construct confines women to domestic world and allows men to go outside. This being so, girls and women were deprived of education and income. Moreover, they were found spending more time in "unpaid and unrecognized" domestic work. Because of the different "worlds" and the involvement in "unpaid and non-recognized" works, the majority of the people of Nepal feel that girls and women as inferior to men. The concept of girls and women being inferior and/or male supremacy contributed to low participation of girls in schools. Moreover, the high value attached to son as (a) lineage protector (b) bread winner, and (c) caretaker in old age has put the girls and women at a disadvantage in terms of education, earning and control over resources.

Modernization effected a paradigm shift in the concept of gender construct. This shift found "gender biased" social construct problematic in ensuring equal rights of girls and women to education and other aspects of their career options. In other words, modernization gave rise to "equity construct". Even the "equivalent construct" was considered problematic. Against this backdrop, curriculum, textbooks, teacher guides of Science, Math, Population and Environment, Health and Physical Education and Computer were reviewed to know whether they are gender sensitive and nurturing "gender equity" and "gender equality" constructs or perpetuating traditionally inherited "gender biased" social construct. The following paragraphs present the findings of the review. The detailed report of the review has been given in Appendixes 6a, 6b, 6c and 6d.

The review of the curricular materials did not reveal a coherent pattern regarding gender related issues. The materials are more gender sensitive in some instances and less in others. The curricular materials for secondary level are more sensitive than for lower level. But it also varies from subject to subject. Secondary level teaching manuals of Mathematics and Science have, for example, clearly pointed out the need of extra support for girls in these subjects because they need more time for practice at home which most girls don't get. The manuals also use gender sensitive and responsive terminologies. For instance, the secondary level teaching manual of Mathematics uses terminologies such as 'female teacher' and 'male teacher', 'female student' and 'male student.'

Besides, the manual has also laid stress on the need of providing gender-friendly classrooms, promoting active participation of girls and boys in the classroom, making gender-balanced seating arrangements and encouraging boys and girls, who feel shy and hesitant to come forward, to participate in the class. It has also stressed the need of the dynamic role of teachers or instructors to attain the goal of gender equity and equality in education and to encourage poor girls/boys in Science and Mathematics by providing them opportunity to learn mutually. But this is not true of the higher secondary Mathematics teaching manual. The manual uses gender neutral terminologies such as teacher, instructor and child. The teaching manuals of Computer Education and General Science of the same level also follow the similar trend. This situation requires further investigation, which was beyond the scope of this research. The primary level teaching manual of Math in particular refers to men when it comes to the matter of money. Father, for instance, is mentioned there comes a question of financing children's education.

But the secondary level teaching manual of Health and Physical Education has a chapter devoted to gender sensitive instructions to inspire girls and boys equally. For example, 'male and female teachers' (*Shykshyak- Shykshyika* in Nepali), mother-father, son-daughter, are some of the gender responsive terminologies used to help create female image as well in the children's mind. However, the same manual has also used the gender neutral terminologies. Gender insensitivity is reflected in a subtle way. There is, for example, one question with regard to population change which on the surface does not show gender biasness: "Do men want to produce children?" But the same is not asked to women. Illustrations are also fraught with examples where men are shown as more knowledgeable. Similarly, women's empowerment is reflected in a very limited scope. For example, an illustration that shows both men and women applying for jobs is praiseworthy but it reflects the notion of empowerment only in economic term.

One of the objectives of the primary level curriculum is to hold a balanced perspective on gender, caste, ethnicity and religion. It also aims at developing a sense of mutual respect among the children. However, it uses gender neutral terms in Math, Science, and Health and Physical Education. Use of gender neutral terms, particularly in Health and Physical Education, overlooks the differential health and nutritional needs of boys and girls and the flow of girls into schools. The instructional strategy of primary level is flexible and supportive to all children. However, it doesn't consider the differential positions of girls and boys in the family and the society at large.

The lower secondary level curriculum of STE is also gender neutral in its explanation of objectives, contents and instructional strategies. The explanations do not realize that girls and boys may possess gender specific practical (indigenous) and theoretical knowledge which is likely to provide them avenues of mutual learning. Even where the efforts have been made to include women's issues, they are dealt with in a very conventional and stereotypical manner. The Population and Environment Education curriculum and the textbook of grade IX (secondary level), which includes a paragraph on the status of women under the "Causes of Population Changes" can be taken as an example. Similarly, the same subject of the same grade has paragraphs on status of women and education and gender equality under the unit of 'Population Management and Environment Conservation'. But the explanation and analysis still hold stereotypical notions (see Annex 5c). This is also true in the case of the higher secondary level

curriculum of Population, health and environment education. Though this is a good beginning, it doesn't make sure that gender and women's issues will be dealt adequately throughout the subject. In other words, gender is used as a separate topic rather than a cross-cutting theme. Inclusion of gender responsive words such as "sons and daughters" in the objectives gives the sense of gender awareness in the higher secondary level curriculum. The curriculum of general science (Physics, Biology and Chemistry) and Computer Education are basically gender neutral but there are also uses of words such as "manpower" and the pronoun like "he".

Review of the textbooks also reveals different degrees of sensitivity. For example, one can find both negative and positive examples of gender sensitivity in the textbooks of grades IV and V on environment. An illustration, given in a fourth grade book, of both the father and mother taking their son and daughter to a health post can be taken as a positive example. Similarly, involvement of women, men and girls in productive works in both IV and V grade textbooks also shows gender sensitivity. The gender neutral word used to refer to the teachers in these books, however, ignores the presence of female teachers. Moreover, excessive use of gender neutral terms has served men's interest for a long time. To put it otherwise, such words still mostly represent men. In a society like Nepal where professions such as teaching, driving, doctor and engineer have been traditionally the men's domain, the use of neutral words reinforce the image of the existence of male figures in such professions. Therefore, in order to socialize men and women differently, gender responsive words need to be used. Similarly, a fifth grade textbook on environment which states women and children getting surprised over a conversation between two boys about the management of water resources not only assumes men as more knowledgeable but also ignores the Nepalese women's century old indigenous knowledge regarding natural resource management.

The Health and Physical Education textbooks of lower secondary level also follow the similar trend. Books of all three grades VI, VII, and VIII show both girls and boys taking part in physical exercise and sports. In grade VI, men, women, girls and boys all are adequately referred to. Similarly, illustrations of a topic on family health of grade VI show both father and mother being engaged in child care. However, in terms of taking care of personal health and hygiene, girls have been presented as doing nothing more than combing and binding their hair, whereas boys are shown brushing their teeth and taking baths. Likewise, the topic on impact of malnutrition does not talk about the severity of its impact on girls as they are given less preference in food distribution.

The secondary level Population and Environment Education textbook contains many topics related to women and gender relation. Textbooks for grades IX and X have gender responsive terminologies. Similarly, the 9th grade book has sexwise distribution of population and children are asked to collect gender disaggregated data in their respective locality. The topics like safe motherhood and reproductive health have been also included in the books of these grades. However, the portrayal of an ideal family with two children (a son and a daughter) conveys the message that an ideal family must always have both son and daughter. This kind of example sets the standard in which the families with only daughters or only sons or children with disabilities don't fit.

The Math textbooks of grade IV and V also reflect a mix of both negative and positive aspects in terms of gender. The books have used both male and female figures in illustrations/examples.

But frequency of male representation is higher. The examples and exercises, however, continue to perpetuate the patriarchal reality that handling money or money-related transactions is the man's domain, as men are the breadwinner of the family and women have no options but to depend them. Additionally, in the grade five book, male names are associated with fruits, milk and other valuable consumables, whereas female names are associated mainly with ribbons and bread. Math textbooks of grades VI, VII and VIII, however, associate female names with money and items like fruit also. In grades VI and VII, Math textbooks contain gender disaggregated data also.

In grade VI, Science textbooks have some examples of both men and women being involved in household work. Both of them, for example, are found fetching water from a well. However, man is depicted as using pulleys and woman a traditional rope to take water out of the well. Similar examples are found in the Science textbook of grade VII also. These illustrations perpetuate the notion that the control of power, resources and technology should rest with the men.

A noteworthy example of gender sensitivity can be found in the Computer Education textbook of grade IX. The book states a female mathematician who was the first computer programmer. Yet use of gender neutral terminologies or words continues to dog the computer textbooks also, both in grades IX and X. Though both male and female names are used in the topic of "File Management", names or pronouns associated with doctor, lecturer, salesperson or computer user are all male. The Math textbooks of grade IX and X are generally gender neutral in the use of terminologies. But attempts have been made to make them gender sensitive through examples. For instance, female wears are used in exercise. Similarly, the notion of an income-making or economically self-reliant woman has been introduced in grade X compulsory Math textbook.

Unlike the grade VI Science textbook, grade IX Science textbook shows women's access to technology. A woman, for example, is shown using pulleys to take water out of a well. But a man is shown as more tense than his female counterpart while doing household work. Such image perpetuates the notion that men are not made for household work and it is women who should take care of it. Regarding the lower secondary and secondary level teacher training manuals, they have been just revamped from the gender perspective. This has already been approved by the Education Human Resource Development Council and is in the process of implementation.

The above review of the curricular materials shows that attempts have been made to become gender sensitive in educational processes. However, according to a CDC source, no specific guidelines have been provided to the textbook writers to focus on gender sensitivity. This explains a lack of consistency in the use of a gender perspective in dealing with the topics or subject matters in curricular materials. The textbooks writers are given a contract in which a list of do's and don'ts regarding financial, administrative and technical matters are stated. The list also reminds the writers to strictly cover all the aspects of the curriculum. This indicates that the degree of gender sensitivity in the textbooks or teaching manuals entirely depends on the degree of sensitivity that the writers possess. This has only resulted in sporadic cases of gender sensitivity in curricular materials. Thus, there is still a need to mainstream gender in curricular materials.

Research in Girls' Education

Bista (2004) reviewed research literatures on girls' education in Nepal that were conducted during the period of 1990–2004. The 20 studies reviewed for this purpose covered four areas of girls' education, namely: (a) role of women teachers in education (b) scholarship and incentive program for the promotion of girls' education (c) gender disparity in education, and (d) barriers to girls' education. In line with the present STE related study, this review commissioned by UNESCO identified scholarships, alternative school program, provision of female teachers in schools, gender training for school teachers and educational bureaucrats as promoting forces for girls' education. The review, at the same time, also identified socio-cultural values, economic hardships of the parents, conflict-triggered constraints, family circumstance of girls, and poor teaching-learning environment in schools as barriers to girls' education. It has also mentioned the measures suggested by different studies. Some of the measures call for reorientation of teachers, increased support to girls and female teachers, and the parental motivation program. But, interestingly, no studies could be found about girls' access to and participation in STE subjects.

Chapter Findings

The Chapter provides four major findings. One, gender parity index and indicators show that disparity exists in many aspects of girls' and women's life. And, educational disparity can be understood as a fallout of these very discrepancies. Two, though efforts were made to promote gender equity, curricular materials were found perpetuating these disparities in the form of "as it stands in society." In other words, "gender-insensitive social construct" was reflected in the curricular materials. Three, no deliberate efforts have been made for mainstreaming gender in curricular materials. Four, efforts have been made to promote gender parity in education by providing scholarships, stationary and textbooks support, and organizing parental awareness sessions.

Chapter III Promoting Forces in Girls' Access to and Participation in STE

Girls of Nepal started taking part in education of late. Feminists argue that patriarchy lies at the bottom of their late entry. Economists blame lack of resources to educate children, especially girls who they value less than boys, while functionalists hold the view that it is the subsistence farming system that demands girls and women to spend their time in agriculture which could otherwise have been spent in acquiring education. Culturists are of the view that school culture is different from girls' and women's lived context and it labels them as "failure" (Bourdieu, 1990). But what has been the socio-cultural construct of Nepal that promotes girls' access to and participation in STE? The present research seeks to answer this question in the following paragraphs.

Five major socio-cultural values were identified that revolve around girls. One, they were viewed as family's liability than assets as they are supposed to be married off to others. Two, virgin marriage remains a prime concern of the parents. Three, they are used "showpiece" in fairs and festivals taking place in the community. Four, they are treated as "sex objects." Five, they are the "objects" to be domesticated. Against this backdrop, some of the values that different ethnic groups of Nepal uphold are presented in the Table below. Though the following Table deals with broader gender based values, they directly contribute to girls' education because such gender based values and perceptions determine the ceiling in girls' education and occupation.

Table 8
Socio-cultural values of some of the studied caste/ethnic groups that reflect gender relations

Topographical Settings	Caste/Ethnic Groups	Socio-Cultural Values Towards Girls and Women
Mountain	Gurung	<ul style="list-style-type: none"> ○ Women of the family play an important social role ○ Especially among the Athapariya Rais, the oldest member of the family, irrespective of gender, is head of the house. ○ Widow is given a choice to marry her brother in-law or remain unmarried. She can also marry an outsider but subject to condition. ○ Different kinds of marriage exist such as elopement, abduction, marrying another man's legal wife by paying penalty. ○ Esp. among the Gurungs, boys and girls are free to mingle with each other and choose their partners, marriage is not forced, divorce is prevalent like an institution, divorcees and widows can remarry according to their wishes, and women take care of business in public as well.
	Limbu	
	Tamang	
	Rai	
Hill	Brahman	<ul style="list-style-type: none"> ○ Divorce is a taboo ○ Many restrictions are placed on widows. They are viewed as bad luck and, therefore, are not allowed in auspicious occasions. ○ Male head of the house has absolute authority, women as they grow older gain power but are still considered and have to remain dependent to male figures (husband or sons or brothers) ○ Restricted social mobility
	Kshatri	

Topographical Settings	Caste/Ethnic Groups	Socio-Cultural Values Towards Girls and Women
Plain or Terai	Muslim	Restricted social mobility, divorce and widow marriages allowed
	Tharu	Divorce, widow marriage and live-in marriage are common, High social mobility
	<i>Dalits</i>	<ul style="list-style-type: none"> ○ Child marriage and Tilak (esp. among Teraian <i>Dalits</i>) ○ Arranged marriage ○ Triply exploited as an untouchable, as a woman and as a untouchable woman* ○ High social mobility due to compulsion to earn for family livelihood.
<p>*Generally women are exploited doubly but in the case of <i>Dalit</i> women, they are exploited triply by virtue of being untouchable.</p> <p><u>Values common to all:</u></p> <ul style="list-style-type: none"> ○ Marriage is a social and cultural obligation. ○ Child bearing is the most important part of a married woman's life, and hence a compulsion. Child bearing, especially giving birth to son, is linked to a woman's security, respect and family dignity ○ Only sons are entitled to ancestral property. 		

Sources: Acharya, 2004, p.12-13.

The above-stated socio-cultural values are central to women's lives and revolve around the girls' marriage. Because of the marriage-centered socio-cultural values, there are very few forces that are conducive to education of girls and women. However, this study shows that there are newly evolved "promoting cultures" that have been encouraging the community, parents, and teachers to ensure the access of girls and women to education in general and STE in particular. The promoting forces (Appendix 4) are discussed in the 12 different headings given below:

Social recognition of girls: This study shows that girls of the two geographical areas- mountain and hill- such as Tamang of Rasuwa, Rai of Ilam, Brahman of Kaski and Kshatri of Doti were encouraged to take STE since they were getting social recognition. The girls were praised for scoring high marks in STE related subjects. This means they are gradually socially recognized. The other recognitions include (a) recognizing them as STE girls and (b) giving the words of thanks to them.

Parents' recognition by the community: Like girls, parents were also found recognized for encouraging their daughters to take up STE subjects. These recognitions were made through praises before other parents who hardly paid any attention to girls' education, dissemination of the excellence achieved by the girls, and thanks extended to the parents by school teachers for encouraging their daughters to study STE subjects. Especially the Gurung community of Mustang district was found involved in recognizing parents during the cultural occasions such as *Putpate* (naming ceremony of the child) and in chatting sessions during the traditional game called, *Ghupchuk*.

Heightened career hope of and for girls: Almost all girls, their parents and teachers were saying that STE subjects serve as a passport for girls to ensure their bright future. They can become staff nurses, engineers or doctors if they take up such subjects. The Kshatris of Doti, Newars of Kathmandu valley, Muslims of Banke and Tamang of Rasuwa were found very much explicit in articulating the importance of STE subjects for future career growth of girls.

Parents, teachers, and the girls themselves were found convinced of this. Moreover, graduation with technical subjects is regarded as social and financial insurance for girls. For example, Brahmin parents of Kaski say girls can have a better future provided they are equipped with degrees in Math or Science.

Encouragement by teachers and parents: This study shows that the parents and teachers played a crucial role in encouraging girls to take up STE subjects. Especially, the educated Newar parents in Kathmandu valley, the Limbus in Panchthar district, Tamangs, Rais and Magars in Palpa district were found encouraging girls for these subjects. Two main reasons may be attributed to such encouragement. One, their exposure to outside world; two, their gradually urbanized settlement pattern. The first reason helped the parents think of the competition their daughters are likely to have with the girls abroad in the future, while their modern life style might have compelled them to think the way as mentioned in the second reason. Some parents of Panchthar think that their daughters, if equipped with degrees in Math and Science, will be able to stand on their own and there will be less chances of them being exploited by their in-laws after they are married off. Some were of the view that these subjects will help ensure better earning, thereby reducing dependency on others for survival. Teachers' pedagogical skills and the nature of the contents were also found to be helpful in attracting girls towards Math and Science. Some girls, for example, from a selected school in Doti responded that as their Science teacher would teach them in a very enjoyable way, they felt more inclined towards the subject. Similarly, the girls from Siraha district also echoed the same views. They also found Science more practical and related to their daily lives. According to Science teachers from Panchthar and Siraha districts, their female students found biology and astronomy more interesting. It was simply because both subjects had the contents which the girls were experiencing or were familiar with. The same teacher from Panchthar further informed that the girls also found the construction of geometry more interesting. In construction, once the girls understood the question, they could do it. A Math teacher from Kaski said that his female teachers show much interest in doing problems like measurement, coordination, and weight as these are taught using real objects.

Examples of STE career model women: Three sources were identified to find out the STE career model women who influenced or motivated girls to pursue these subjects. One, there were some STE career model women around the schools or community. Two, teachers would provide examples of such women in the classroom. Three, the girls themselves were exposed to the STE career model women through electronic and print media. These cases were identified in Kshatri and Newar communities in the areas covered by the study. The Kshatriis traditionally remaining in the "power center" and the Newars involved in trade might have been influenced by the role models. As a legacy of the cultural power structure, the girls in these communities might have been trained accordingly and their outlook shaped by the role models they find appropriate for them.

Institutionalized exhibitions, library and lab facilities in school: Different sources of information obtained from the qualitative study show that there were schools which have institutionalized STE exhibitions and provided lab facilities and libraries with STE related books and magazines. Besides, there were Secondary Education Development Units (SEDUs) to train teachers in order to make them gender sensitive and equip them with STE teaching skills. This situation was found existing in schools with students from Limbu, Kshatri, Magar, Newar,

Muslim and Tharu communities. These efforts helped girls enjoy STE subjects. This implies that even schools can play an instrumental role in ensuring girls' access to STE subjects. Private schools were found more enthusiastic in institutionalizing exhibitions, and providing lab and library facilities. And, so was the case with the schools conducting higher secondary levels of education.

Support of colleagues, parents and elder siblings for STE learning: Most of the girls consulted found Science and Math difficult to understand and comprehend. This difficulty drove them to seek the help of their colleagues, parents and elder siblings. The generous help they received significantly helped the girls fare well in Science and Math. This case was very true with the girls from the Kshatri, Yadav and Muslim communities. Basically, the girl students of the second generation in school received such supports. Secondly, the outgoing girls enjoyed the benefits out of this support. Thirdly, there were schools that were promoting collegial learning and learning from the parents and elders through project works. Both the private and public schools of city centers and district headquarters were found to be encouraging girl students to learn that way. There were occasions when girls were given group scores for such undertakings. Even the parents and the elder siblings come to schools to discuss the matters relating to STE subjects.

Tutorial support to girls for STE learning: Girls of the studied schools put across their views that they were encouraged to learn STE subjects because of the tutorial support made available to them. Most of the girls sharing such views were from Limbu, Tamang, Brahman and Kshatri caste or ethnic groups. This was found in Siraha as well. Interestingly, in Siraha, a local club had provided such tutorial classes. The girls further clarified that they needed tutorial support partly because of their weak base and partly because of the teacher's irregularity or inability to make them understand things clearly. Whatever may be the reason, providing private tutorial support in Science and Math especially in times of exams was common in most of the study districts.

Girls' exposure to STE: Initiatives aimed to expose students to STE also became instrumental in arousing girls' interests in taking up STE subjects. These girls belonged to different ethnic/caste groups. As shown by the study, they were exposed to science and technology education through workshops and exhibitions in Yadav community, discussion sessions in Newar community, and exhibitions in Muslim, Magar and Limbu communities, and through visits and exhibition in Tharu community. This implies that even the pedagogical reorientation for additional exposures can go a long way in ensuring girls' access to and participation in STE subjects.

Competition between boys and girls in STE learning: This study showed that girls tend to learn in groups and boys individually in schools. This led to creating a sense of competition among boys, while girls being in groups turned cooperative with each other. An analysis of the Muslim and Kshatri girls has substantiated this fact. The knowledge of how girls learn things will help ensure their access to and participation in STE.

Emulation of neighbors and role models: In the study areas, some girls and women who were role models were identified. These role models triggered the interests of some girls in STE subjects. Primarily the girls from the Tamang and Brahman communities were found impressed

by such models. As the respondents said, either parents encouraged their daughters to emulate someone or girls themselves found someone to be worth-emulating. This implies that girls are encouraged for STE learning because of the presence of worth-emulating role models around them.

Awards and scholarships: Both parents and girls were of the view that awards and scholarships also serve as an incentive for girls to arouse their interest in Science and Math more than in any other subjects. The respondents belonging to Kshatri and Muslim communities were more vocal about this. This analysis amply makes it clear that incentives will attract girls towards the STE subjects.

The points in question show that there are many factors contributing to ensuring girls' access to and participation in STE. Even the policy and planning level authorities of the Planning Division of MOES, NCED, CDC, HSEB and SESP were found claiming that scholarship support, tutorial classes for girls, gender sensitization training for teachers and revision of curricula from a gender perspective were the factors responsible for promoting girls' access to and participation in STE subjects. However, some of these factors are associated with the parents' support for girls to participate and succeed in STE, and their expectations out of their daughters. The high expectation from their daughters indicates that orientations for parents and students about STE will further help ensure girls' access to and participation in the subjects. Besides, conducive forces are also associated with the pedagogical rearrangement which allows girls to learn more by linking what they practice in their household chores with what they learn in classrooms. But they are taught only theories and told to go parroting. This, by extension, means a change in teaching of STE subjects should be considered as a necessity to ensure girls' access to STE subjects. Furthermore, there are subjects for which girls need extra support such as additional coaching. A provision for financial support has been made to ensure girls' access to and interest in STE subjects. Social recognition of parents and their daughters is yet another factor in this regard. And, finally one has to create a healthy and constructive competitive culture in respect of this. This, however, should in no way be done at the cost of cooperative learning culture of the girls.

Chapter Findings

Basically eight forces were identified promoting girls' access to and participation in STE subjects. They were: social recognition of girls and their parents, high career expectations of the girls and their parents, encouragement to the girls from their teachers, parents and elder siblings, examples of STE related role models (girls and women), increased physical facilities in school, tutorial support, the high competition between girls and boys, and the provision of material awards for the best performing girls such as scholarships, medals and stationary supports.

Chapter IV Hindering Forces in Girls' Access to and Participation in STE

There are many forces that hinder girls' access to education. One, religious orientation of Hindus and Buddhists did not encourage girls to be educated as demanded by the changed context. Two, subsistence farming demanded children to be engaged in agriculture, making girls the first victims. Three, social values that encourage girls to be domesticated did not allow family and girls to consider education as necessity. Four, gender biased division of work never realized the importance of education for girls. Five, parental illiteracy, especially of mothers, did not help much in daughter's education. Six, low economic status of the people was another factor affecting their education. But what are the factors that are responsible for preventing the girls from participating or for their low representation in STE subjects? They are discussed below.

This study has identified eight different forces standing in the way of girls' access to and participation in STE subjects. The first hindering force is the socio-cultural value system that has perpetuated the gender biased social construct. Then comes the teachers' attitude and their teaching process largely centered around theoretical aspects. The third factor is girls' shyness for interactions, their submissive social orientation and their career ceiling. The fourth is their agrarian lifestyle and/or abject poverty. The "grace giving culture" is another factor standing in the way. The sixth factor is related to boy students' attitude towards girls. The seventh emerged out of the notion of early marriage system. The eighth factor is concerned with the classroom setting and seating arrangement. These factors are dealt at length in the following paragraph (Appendix 5).

Socio-cultural values as source of hindrance: The Nepalese culture has prescribed many do's and don'ts for girls and women. For example, Tamang community of Rasuwa district observes *Ghewa* (death ceremony) that demands girls for serving wine, *chhang* (locally brewed beer) and alcohol to the invitees and for carrying *pahur* (gift) to the home of the deceased. There is yet another fallout of this culture. They are abetted to get engaged in sexual activities. Because of this cultural practice, girls were found less inclined to study and attend classes regularly. But in Gurung community of Mustang district the scenario was different. The girls were encouraged to take care of their trade or business. School-going girls, for example, of Mustang were found heavily involved in family trade/business. Each home had the provision of lodgings for tourists and girls were culturally assigned to serve and entertain their guests. This socio-culturally inherited expectation from girls and economic value of girls especially in mountain districts of Nepal provided very little time for the girls to study the "difficult subjects" like Science and Math.

In the hill districts of Nepal there were also other types of obstructive forces that go against providing girls' access to and participation in STE subjects. For example, this study found that Limbu girls of Panchthar district observe *solu bokne chalan* (culture of carrying gifts) in times of marriage, post-marriage and death ceremonies, and other rituals, for which girls are required. These girls once gone on such ceremony remained absent from school for a number of days. Besides, many girls eloped with boys working in foreign countries or *Lahures*. This encouraged the girls to be more sexually appealing rather than to be academically smart. Similarly, Magars

of Palpa district had *Rodhi* and *Sorathi* culture (traditional night club culture) which require girls almost everyday for singing and dancing. They are expected to spend more time in entertainment,. As a result they will be left with little time to study “hard subjects” like Science and Math.

In the Terai districts of Nepal, girls’ qualification is associated with their parents’ ability to provide dowry to the groom. For example, in Siraha district, the Yadavs are supposed to pay dowry depending on the level of qualification of their daughters. This has its adverse impact on the community which, as a result, was found less interested in financing girls’ education in general and STE subjects in particular. Muslim girls also have the problem of getting education. Culturally they are not allowed to get mixed up especially with male classmates and teachers. The irony is that these girls were found studying in co-ed schools where most of the teachers were male.

The ceiling created by the girls that they need not acquire higher education was also found hindering their participation in subjects like Math and Science. Some girls selected for interview said these subjects were likely to benefit boys more than girls. Their argument was that since boys can go anywhere for the sake of jobs, these subjects will provide more opportunities to them. The girls also spoke of their restricted social mobility as a demotivating factor in pursuing STE. This restriction on girls is rooted in the relation between family dignity and sexuality of women and girls.

Teachers’ attitude and theoretically oriented teaching techniques: Three types of teachers were identified in the study districts as a demotivating force for girls’ access to STE. The first types were found in Gurung community of Mustang district who didn’t show much responsibility towards girls’ education. They, according to the girls, would not even bother to answer their STE related queries. Some of them showed frustrations and anger with girls for no apparent reasons. Field researchers, however, found that it was because of the problem of communication between teachers and students since most of the STE teachers were from southern part of Nepal who had difficulty in understanding the Gurung language. The second types of teachers were those who did not pay attention to the girls during the teaching. A teacher, for example, from Kaski district responded that girls are comparatively duller than boys. Another teacher from one of the study districts also said in his 20 years of teaching experience he found that there were certain things that girls’ brain just could not figure out. In Kailali district also, there were teachers who were less attentive towards girls and in Siraha there were pro-boy teachers. These scenarios indicate that some teachers are orientated to believe that girls are relatively less intelligent than boys. The third type of teachers, a woman activist says, has the tendency of dominating girls.

Girls’ shyness for interaction: Almost all respondents of the study districts remarked that girls have inhibition to ask questions and it was more glaringly noticed particularly in Mustang, Doti, Panchthar, Kathmandu and Siraha districts. The Gurung girls of Mustang were hesitant to argue and put across their views before teachers, while the girls of other districts were simply hesitant to ask questions to the teachers. An analysis of the classroom dynamics also confirmed this finding by observing that there were very few girls who asked questions to the teachers. Classroom observation in Doti found a female Math teacher reproaching a girl who asked for

clarification. However, Tamang girls from the Rasuwa district were found less hesitant to ask questions to the teachers.

Moreover, some girls in Panchthar argued that most boys have sharper brains than that of girls so that they were good in subjects like Math and Science. Only few girls, they added, have such sharp brain. In the district some girls said they didn't ask boys questions out of fear that they would be beaten up. In most districts girls were found to be afraid of asking questions because of the fear of being humiliated. Besides, girls had created their own ceilings in view of the role of their mothers, role models, social orientations and the classroom environment. Their limitation must have also been based on their experience of gender relations at home and in the community. These scenarios, observations and experiences might have contributed to the girls' inhibitions to interact with teachers and ask questions related to Math and Science. These findings help us understand five things. First, girl's shying away from asking questions can be attributed to the nature of personal relationship between teachers and students. Second, it might have come from cultural orientation of the girls towards their relationship with male teachers. Third, the nature of teachers being strict to students might have made them hesitant. Fourth, it might be the result of the social orientation of girls to be "obedient and docile." Fifth, the girls had different background about STE knowledge to ask questions and argue with the teachers.

Agrarian lifestyle and/or abject poverty: With a few exceptions, the girls interviewed and observed belonged to agrarian and middle-class low income families. Because of this lifestyle or the situation they are in, girls were found either overburdened with domestic chores or were supposed to earn their living through labor work. As a result, inadequate time was available to them to spare for "difficult subjects" like Math and Science or by the end of the day they would be too exhausted to put in their efforts in such subjects. An analysis of districtwise information shows that Gurung girls of Mustang district were found busy in tourist business. But the Limbu girls of Panchthar, Tharu girls of Kailali and Yadav girls of Siraha districts were found heavily involved in domestic chores. Because of this involvement in household work and low family income, girls had either no time to study or they were already exhausted by the day-end. This situation spells the presence of gender-biased social construct that always burdens girls with domestic responsibilities and sets boys free as bread winner of the family in the future. The study furnishes several reasons explaining why girls were overloaded with domestic works. One, girls, by following socio-cultural orientation, were obedient and being so, it is usually they who should bear the responsibilities. Two, girls themselves emulated other girls, mothers and sisters as role models. Three, even parents who follow certain cultural values, such as Limbus of Panchthar district, considered girls as "volunteer labors" to help them with their work before they are married off. Four, male students viewed girls as home or family care takers rather than their competitors. Five, girls were taken for granted as docile and obedient beings by the teachers. Six, the outlook of society towards girls, to a larger extent, shaped their mind and self-identity, and determined their position in society, thereby affecting their interest in higher academic pursuits.

Grace seeking parents and grace giving teachers: Quality indicators and portfolio assessment forms do not exist in the Nepali education system. However, continuous assessment system has been introduced in primary grades. This assessment system has encouraged teachers to maintain portfolio assessment record. Experiences and the internal study, conducted by CDC

(CDC, 2004), give the impression that portfolio assessment has been made a ritual. Besides, national quality indicators have just been developed (DOE, UNICEF, and World Education, 2004) for primary schools. In such situation, teachers' ethical consideration and examination score were the only sources of quality indicator. It is where parents wanted grace score for their daughters. On the other hand, girl students themselves wanted grace because they were warned by their parents that "if you fail, you will be immediately dropped from the school" or "you will be married off." Such situation gave a fillip to grace seeking and grace giving culture. This "grace culture" left many girl students weak at their base and, hence, they could not fare well in education, especially in Science and Math in higher grades. They rather paid less attention to these subjects as they demanded hard work and sound educational base. For example, parents of Kshatri girls from Doti, of Newar girls from Kathmandu, Tharu girls from Kailali and Yadav girls from Siraha were found asking or compelling teachers for grace marks. A number of reasons were detected behind the rise of such culture. One, parents needed their daughters' certificate as a proof of education for the girls' salability in marriage. Two, girls do not get adequate time to study at home and, hence, according to some of the respondents, need grace marks to be promoted. Three, teachers realized that if the girls fail, they may be dropped out of the school and the number of students will be decreased with a domino effect on their jobs. In other words, the teachers may be transferred elsewhere or relieved of their service. Four, it is likely that the teachers who are irregular tend to give grace marks to escape allegations. The students' responses about teachers' absenteeism in some study districts support this claim. Those from mountain regions were more articulate about the impact of teachers' irregularity on their learning. Five, some teachers believed that the girls receiving grace marks may eventually do better in the future. Six, in the case of Doti district, it was also considered as a passport to marry the girls off.

The Kshatri community in Doti has the culture of "selling girls" where bold girls often say, "I want to sell myself in marriage for Rs 10,000 (approx. US \$ 135), for my parents are poor." The girls, even during their monthly period, are not allowed to go schools for ten days in Doti for reasons of impurity. They were isolated from other members of the family to be kept in an outhouse during the period. It may be noted here that schools in Nepal are considered as the temple of Goddess *Saraswati* (Hindu goddess of education). Therefore, in most schools, one is likely find a temple of *Saraswati* and it should always be kept pure. The concept that the girls in period are "impure" was found hindering their access to and full participation in school. This naturally impaired their ability to do well in subjects like Science and Math exacting regular attendance.

Male students' attitude towards their female counterparts: Four types of boys were identified during the course of this study who in one way or the other stood in the way of girls' access to and participation in STE subjects. Their behavior can be categorized as (a) teasing (b) looking with a roving eye (c) indifferent, and (e) envious. These behaviors were noticed especially in Mustang, Panchthar and Kathmandu districts. This, however, is not confined to these areas only. The acts of teasing and looking with a roving eye may be taken as something natural in these groups of "free society" while indifference and envy are the natural fallout of the culture of competition.

Notion of virgin girl marriage: Both Hindu and Buddhist cultures worship virgin girls as goddesses. This is why males tend to look for virgin girls for marriage. Such a value system still

holds a grip in the psyche of the Nepalis. The marriage ceremony itself reiterates the need of virgin girls to be married. This value system was found reflected in (a) early marriage of girls as a means of protecting virginity and as observing the practice of worshipping virgin girls (b) parents' control over their daughters' mobility to ensure their virginity (c) social obligation of the parents to find grooms for their daughters which demands virgin girls (d) protection of the patriarchic value system that demands girls to be virgin. These practices were found with Gurung girls in Mustang district, with Brahman girls in Kaski district, Muslim girls in Banke district, and Yadav girls in Siraha district. But there was one additional fear of parents, teachers and other respondents in Doti and Panchthar districts. The fear was- if the girls remained unmarried, they would elope with others who may not be a match to their caste or ethnicity or social status. In such situation, the girls seemed unlikely to continue their education, let alone studying "difficult" subjects like Math and Science. They rather preferred subjects considered as "easy." Besides, they are brought up in such a social milieu where marriage is taken as something unavoidable because (a) parents start talking about the marriage of their daughters when they become teenagers (b) girls may elope with others before their study is complete setting examples for others (c) societies including boys at school talk about the marriage of girls (d) the girls themselves may find that thoughts and actions of even the educated girls basically revolve around marriage.

Classroom setting and seating arrangement: Different approaches were adopted to organize classroom settings. The following Table presents these approaches:

Table 9
Seating Arrangement in Classroom

Left-right setting (frequently used)	Mixed setting (moderately used)	First and next setting (rarely used)	Girls first setting (rarely used)	Rotational setting (rarely used)
Girls on the left row and boys on the right row of the classroom; this arrangement can be understood as a legacy of traditional notion of husband being at the right and wife at the left side while sitting on formal occasions	Boys and girls are seated on the same bench. This can be called a non-traditional mixed approach.	Girls are made to sit on first bench and boys on the next. This can be seen as an alternative seating arrangement.	Girls are seated on the last bench and boys on the first benches. It is partly because girls arrive late and partly because girls are bullied by boys into leaving the front seats for them.	Rotation of boys and girls by bench. In other words, they change their seats each day, moving from one to another.
Kailali, Palpa, Kathmandu, Kaski, Ilam	Kailali, Rasuwa, Kaski, Mustang	Palpa, Banke, Kathmandu, Kaski, Panchthar	Kailali, Siraha	Doti

The above Table indicates that each district, each school and each grade could have different seating arrangement. Besides, there were some districts which appeared to be different from others. An analysis of classroom observation report shows that usually best students, no matter whether they were boys or girls, sat on the front rows, while the weak ones usually sat at the

back. And, the teachers invariably tended to give more attention to the front seaters, regardless of their sex.

During the focus group discussions, it was found that teachers and head teachers (a) followed the tradition of the school (b) experimented the classroom settings on the basis of what they think best (c) used the value system they prized to ‘prevent girls’ from getting mingled with boys (d) arranged the classroom settings in such a way that it would encourage back benchers to come forward, and (e) wanted to change power relations shaped by the socio-cultural norms through the classroom setting. This implies that the teachers and head teachers used different value systems in deciding the classroom setting. They are: One, boys and girls, if mixed together, will have a chance of being sexually motivated with each other, and so they were seated separately, in left and right rows. Two, they were kept in different benches so that the teachers need not mediate between the girls’ cooperative learning style and the individual competitive learning style of boys. Three, they were mixed because they all belonged to the same community and members of the same blood relations. Four, some teachers were found indifferent about seating or classroom arrangement. This group of teachers believed that boys and girls were equal so they could sit anywhere they would like to. Five, teachers realized that students sitting on the first bench will have a higher chance of getting teachers’ attention and the opposite could be equally true of the last benchers. Keeping this thing in mind rotation of students was introduced. Interestingly, this arrangement was made for all subjects and not only for Science or Math classes. Moreover, in all observed schools students had no chance to interact and learn from each other. They were rather supposed to learn only from the teachers or same sex peers. Though efforts were made to find out the effect of classroom seating arrangement on girls’ access to and participation in STE subjects, little information was available about it. An analysis of the available information suggested that girls could be placed on the front benches in order to make them more attentive; teachers could be more responsive to the backbenchers.

The consulted authorities of the Planning Division at MOES, NCED, CDC, HSEB, and SESP reiterated the earlier findings. They viewed that (a) parents are unaware of the importance of STE subjects for girls (b) they have inadequate financial resources to support STE subjects, especially in higher grades (c) there is a fear that the girls will not find jobs even after they acquire education (d) parents expect less from the girls no matter whether they study STE or non-STE subjects (e) curricular materials are gender-biased, and (f) girls have less chances of having free time to do their home work or practical works because they are overburdened with responsibilities.

Chapter Findings

Nine hindering forces were identified regarding girls’ access to and participation in STE subjects. They were: cultural values and beliefs that demanded girls for birth, marriage, and death ceremonies; extreme cultural practices which either encouraged girls to serve drinks and be part of the entertainment or restricted them from mixing up with males; subsistence agrarian lifestyle which required children to work; culture of virgin marriage; theoretically oriented and practically unlinked pedagogical process; culturally imbedded girls’ inhibition to ask questions with teachers; culture of asking for and providing grace marks; gender-biased attitude of boys and other males towards girls’ work and their career growth; and one way learning seating-arrangement.

Chapter V Gender Gap in Achievement

Gender gap in education is obvious (Appendix 7a & 7b) in a gender segregated society like Nepal. The country has different caste, ethnic and topographical groups with varied degrees and forms of gender discrimination. Yet efforts were made to find out gender gaps in the obtained scores on STE subjects, and average attendance and success rates in schools. In doing so, the data of three years of 55 schools in 11 districts were electronically processed. These data were provided by the caste groups of Brahman and Kshatri (so-called high caste groups), indigenous groups such as Newars, and by the Terai groups. An analysis of the gap will offer us a picture that shows discrepancies between boys and girls in many ways. The following paragraphs present these discrepancies in STE related subjects. The gaps are mentioned in the mean score. With population studied is large enough, even the gap of one or two percentage has been also accepted as statistically significant. The picture of opening school open days and the attendance of teachers and students has been given and efforts have been made to explore gender gaps in different situations.

School opening days and teacher attendance: The current education regulation has laid down the rule that schools should be open for a minimum of 220 days in a year. But this study found very few districts abiding by this rule. It is very likely that the political unrest, frequent Maoist *bandhs* (strike), blockades and sanctions, armed fighting between the Maoist guerrillas and state security forces in the school zone and in public places, teachers' absenteeism and their strikes and, in some cases, strikes called by the students themselves have affected the schools' operation.

Public schools have earned disrepute for teacher irregularity. This irregularity might have affected the students in their learning and contributed to widening the gender gap. Keeping this situation in mind, teachers' attendance days were calculated and efforts made to examine their effect on gender disparity. The Table below shows the school open days and attendance of teachers.

Table 10
Average School Opening Days and Teacher Attendance in the Study Districts

SN	Districts	Average open school days	Average teacher attendance days
1.	Rasuwa	244.14	170.87
2.	Mustang	253.62	205.60
3.	Panchthar	219.08	152.11
4.	Ilam	222.31	191.50
5.	Kathmandu valley	209.00	205.5
6.	Kaski	230.04	214.12
7.	Palpa	199.87	178.90
8.	Doti	231.00	204.40
9.	Kailali	223.20	207.61
10.	Siraha	217.44	193.21
11.	Banke	218.32	191.99

SN	Districts	Average open school days	Average teacher attendance days
	Mountain	248.82	187.88
	Hill	221.06	193.69
	Terai	218.71	197.37
	All Nepal	225.43	194.01

The Table above illustrates that schools open more regularly in mountain regions than in other regions, while Terai ranks last. Various factors are responsible for this. Mountain districts are normally less affected by the political unrest, the Maoist insurgency, teacher strike, etc. The interview and observation also proved this. It also may be that the teachers from the mountain districts might have presented the falsified data to the researchers. But the cases of Terai and hill districts are different because they are either affected by political unrest or insurgency or other kinds of disturbances. The current situation of conflict in hills and Terai supports this perspective.

The teacher attendance data show a similar trend. The teachers of mountain districts were more regular than those of the Terai districts. But the qualitative study shows just the opposite. The teachers of the mountain districts were reported to be more irregular than the teachers of the hill and Terai districts. Efforts were made to analyze the link between gender gap in STE and teacher attendance as well as school open days. But no definite trend could be identified in this respect so no claim could be made about the impact of school open days and teacher attendance on girls' STE.

Students' attendance: Who attends the school more, boys or girls? How has the students' attendance affected their achievements? In order to answer these questions, students' attendance days of all 11 study districts were analyzed. Efforts were made to find out its effect on girls' achievement as well as pass percentage. The following Table displays the attendance data.

Table 11
Average Number of Student Attendance Days by Sex

District	2058			2059			2060		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Panchthar	93.59	100.39	96.94	108.71	111.76	110.33	98.99	107.12	103.51
Ilam	133.51	135.26	134.43	124.35	126.28	125.38	136.33	138.72	137.64
Siraha	98.41	102.21	99.84	110.62	111.24	110.87	115.74	112.41	114.44
Kathmandu Valley	140.45	149.73	144.81	160.12	164.41	162.30	155.39	161.91	158.77
Rasuwa	143.00	138.92	141.36	133.39	142.60	137.33	136.69	139.72	137.98
Kaski	188.96	189.14	189.05	192.92	195.14	194.12	188.51	187.19	187.80
Mustang	133.03	118.68	126.30	215.97	219.69	217.93	202.60	198.00	199.99

District	2058			2059			2060		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Palpa	163.32	166.22	164.53	166.75	172.26	169.06	158.50	172.23	164.38
Banke	145.54	133.80	139.66	145.07	131.31	137.86	146.84	134.15	140.29
Doti	171.82	173.10	172.22	169.09	175.88	171.34	164.26	170.88	166.55
Kailali	160.48	163.34	161.56	166.69	166.14	166.47	161.75	166.34	163.61
Group Total	138.63	140.33	139.39	145.27	145.63	145.44	144.94	146.31	145.58

The above data on students' attendance do not show any significant disparity between boys' and girls' regularity. In this sense, student attendance data challenge the general notion that girls are more irregular, which was reiterated in the qualitative information of this study as well. The cases of some districts, however, do support the qualitative data to some extent. For example, in primary, lower secondary, secondary and higher secondary levels, girls' attendance remained low in the two Terai districts of Banke and Siraha during the three consecutive years. It was only in 2059 in lower secondary level and in 2058 in secondary level that girls of Siraha were more regular than boys. In higher secondary level, girls were more regular than their male counterparts in all the three consecutive years in Kathmandu and Kailali. In higher secondary level, girls' attendance was lower than that of boys in 16 out of 24 reported cases (districts). A districtwise analysis shows secondary level better than other levels in girls' attendance. There were other cases also where the girls' attendance was low, but that of boys also remained significantly low in many districts for many years. The analysis, levelwise and castewise, of the data gives different pictures. The castewise analysis of the girls' attendance didn't show a significant difference across groups. The attendance pattern of the primary level of the last three consecutive years shows that the girls' attendance irrespective of their caste has increased. However, the attendance, among the girls from ethnic groups, was decreased in the second year but increased in the third year in the same level. In lower secondary, a definite pattern was not noticed. But, in secondary level, the trend of girls' attendance was found either decreased or static. The trend in higher secondary level showed decrease in girls' attendance regardless of caste or ethnic backgrounds. But the pattern was not static among the Newar and Terai caste groups at this level.

In some cases, qualitative and quantitative data gathered from different sources could not be tabulated. In other words, qualitative data indicated that girls of the ethnic groups tended to be irregular in classes because of their cultural practices or responsibilities, which the quantitative data didn't match. For example, the Tamang culture requires its girls for months during their cultural ritual called *Ghewa* (death ceremony). So does the cultural ritual of Limbus during *Soli bokne* (carrying gifts) days. But the quantitative data did not match with these findings. But the girls were not reported absent in school registers during these days. This finding has raised an ethical question whether the teachers were reporting these girls as present in schools even when they were absent. They might have done so because, as mentioned earlier, one of the criteria for the operation of schools was that they needed to reach a certain mark in attendance of the students.

As revealed by the Table above, the Terai girls were attending schools less than the boys. In the higher secondary school level, the data did not provide any specific trend, implying that girls'

attendance differs from school to school and location to location. And yet, girls' attendance did not surpass that of boys in higher secondary school. Girls' attendance in primary grades, in fact, remained higher but it began to decrease as they moved up the class ladder. This implies that the demand for girls at home and in the community increases in proportion to the increase in their age. Consequently, the higher they go up in classes, the lower attendance they will have.

Gender gaps in population and environment education: The Table below has stated five trends. One, with some exceptions, boys always scored more than girls. Two, both boys and girls failed to fare well in population and environment studies. Three, boys in many occasions scored more than the average score of the classroom but the girls could not do so. Four, both boys and girls scored more in higher grades than in lower grades and yet girls remained low achiever than their male counterparts. Five, only in grades X and XII, girls could score more than fifty percent. But the boys' position was also no better than that of girls here. The following Table presents the details.

Table: 12
Average Progress in Population and Environment Education

Grade	Year	Total	Boys	Girls
4	2058	42.03	42.21	41.84
	2059	42.92	41.96	43.87
	2060	45.56	46.07	45.05
5	2058	41.63	42.74	40.52
	2059	43.87	43.57	44.17
	2060	43.29	42.8	43.77
6	2058	23.29	23.66	22.93
	2059	24.17	24.35	23.99
	2060	23.88	23.9	23.87
7	2058	25.09	25.07	25.12
	2059	24.83	25.05	24.6
	2060	25.28	25.52	25.03
8	2058	26.04	26.88	25.19
	2059	24.72	24.8	24.65
	2060	25.58	26.05	25.12
9	2058	47.18	47.35	47
	2059	46.55	47.02	46.09
	2060	47.9	48.03	47.77
10	2058	54.01	55.02	53
	2059	54.48	55.73	53.24
	2060	50.87	50.86	50.88
11	2058	45.58	45.63	45.53
	2059	39.44	40.5	38.38
	2060	40.06	40.47	39.66
12	2058	54.7	54.09	55.3
	2059	43.94	44.22	43.67
	2060	49.95	50.43	49.48

The qualitative data, however, present diverse pictures. As revealed by the data, girls are better in population and environment subjects and it is simply because the contents are related to their lived reality. The girl students are more inclined to learn such subjects because (a) these subjects are practically taught (b) they don't have theories and formulas to rote (c) teachers organize visits and exhibitions (d) project works are assigned in these subjects (e) girls have a feeling that these subjects are easy to understand (f) teachers provide examples from the lived life, and (g) these subjects do not need more time to prepare. But the geographic location, ethnic or caste composition and districtwise analysis (Appendix 9 a) of the performance show some variations. (See Table below)

Table 13
Gender Gaps in the Achievement of Population and Environment Education by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District
With the exception of the result of 2058 BS, girls are ahead of boys in primary grades. In lower secondary and secondary levels, girls are ahead in all the three years. And in higher secondary level as well, girls are equally competent.	<p>In Terai region, girls lagged behind boys in primary grades. They lagged behind in lower secondary and secondary levels also. But the exception was observed in 2058 when girls scored a bit more than boys. Similarly, girls were found ahead of boys in 2060, but in the remaining years, they lagged behind.</p> <p>Girls from the mountain scored more than their boy counterparts in primary grades. But the girls from the same region lagged behind in lower secondary, secondary and higher secondary levels.</p> <p>In the hills also, girls were ahead of boys in primary grades except in the year 2058. They secured better position in lower secondary level also. But they lagged behind boys in secondary level. In higher secondary school (except in 2060), girls scored more than boys.</p>	<p>Brahman and Kshatri girls were ahead of boys in primary and lower secondary levels. But they lagged behind in secondary and higher secondary levels in 2058 and 2060. <i>Janajati</i> girls (girls of the indigenous community) were also found ahead of boys in primary grades but they scored less than boys in lower secondary levels in the years 2058 and 2060. In secondary and higher secondary levels, they scored less than boys in 2058 and 2059. Girls of the Newar (one of the <i>Janajati</i> groups) community scored higher than boys in primary schools in 2058 and 2059. They scored higher than boys in lower secondary and secondary levels in 2059 and 2060. But they lagged behind in higher secondary level. And in the case of <i>Dalit</i> girls, they achieved higher marks in primary grades in 2059 and 2060. But, in the same years, they lagged behind in lower secondary level. They also lagged behind in secondary level in all three consecutive years.</p>	<p>In the mountain district of Rasuwa, girls at primary level scored more than boys. So was the case with lower secondary girls (except in 2058). But the girls of secondary and higher secondary schools achieved less than their male counterparts in all three consecutive years.</p> <p>In the case of hill district of Kaski, girls scored more than boys in primary level (except 2058). But they were slightly behind in lower secondary (except 2059) and secondary levels (except 2060). And in higher secondary schools, they scored a bit more than the boys.</p> <p>In the Terai district of Kailali, girls scored more than boys in primary and lower secondary levels. But they didn't score more than boys in 2058 in lower secondary level. In secondary level, girls scored more in 2059 but failed to keep it up in the next year. And in higher secondary level, girls were low achievers.</p>

Overall	By Region	By Caste/Ethnic Group	By District

The Table above strongly emphasizes that girls were high achievers in primary grades, but they start to lag behind the boys as they climb up the ladder of education. This clearly shows that girls pay more attention to education at early age. But as they grow older, they are expected by their parents to expend more time in household chores, as a result of which they will have less time left for study. Nobody seems to be worried about their future because neither girls themselves, nor teachers, nor their parents expect much from their education. As a result, they are bound to obtain less marks in examinations. This analysis implies that pedagogical reforms such as change in classroom teaching and also career counseling are necessary to help out the girls.

Gender gaps in Mathematics: Mathematics was considered as one of the most difficult subjects for most of the girls. Nevertheless, some girls found geometry easier, and others algebra and arithmetic. Even the quantitative data presented in the Tale below supports this argument. It shows that (a) except in grade XI and XII girls' score is generally lower than boys (b) all the girls were below the class average (c) the girls usually found geometry and algebraic and arithmetic formulae difficult. The following Table provides the average scores obtained by boys and girls in Mathematics.

Table 14
Gender Gaps in the Achievement of Mathematics

Grade	Year	Total	Boys	Girls
4	2058	35.44	36.95	33.94
	2059	37.48	38.93	36.03
	2060	37.13	39.08	35.18
5	2058	35.87	37.52	34.22
	2059	36.15	37.86	34.44
	2060	36.57	37.36	35.77
6	2058	31.45	33.28	29.63
	2059	31.37	33.09	29.64
	2060	29.33	31.22	27.43
7	2058	30.85	31.81	29.88
	2059	30.69	32.07	29.31
	2060	31.79	34.27	29.3
8	2058	29.66	31.91	27.42
	2059	31.29	32.74	29.84
	2060	31.01	33.17	28.85
9	2058	28.15	30.61	25.69
	2059	30.38	32.61	28.16
	2060	29.81	32.16	27.45
10	2058	31.07	33.52	28.63
	2059	32.6	36.37	28.83
	2060	34.65	37.43	31.87

Grade	Year	Total	Boys	Girls
11	2058	37.3	39.2	35.41
	2059	41.96	38.72	45.2
	2060	38.6	36.93	40.26
12	2058	47.21	44.65	49.78
	2059	45.95	45.36	46.55
	2060	41.41	38.62	44.21

Reflecting upon the qualitative data and relating it with the quantitative information, it was found that (a) girls were labeled as weak in Mathematics (b) girls themselves thought that Math is difficult and only boys could do it easily because they are smarter and get adequate time to practice it at home (c) girls used the social construction approach (this approach believes that learning occurs through lived experiences) to learn Math because of their heavy involvement in social world, but the teachers taught it by applying cognitive approach (this approach believes that learning occurs through mental exercises) (d) girls, unlike boys, did not see their prospect in Mathematics as their career option and were, therefore, less serious about it (e) teachers failed to take examples out of lived experience of the girls and they rather focused more on theory or abstract things while teaching, (f) parents and elder siblings also did not encourage girls to learn Mathematics as much as needed, and (g) some teachers just believed that girls are less intelligent than boys. These entire forces created, perpetuated and maintained gender disparity in Mathematics. The grace score that the parents asked for and the teachers gave further aggravated this situation. Data were also analyzed from different perspectives to understand the girls' Mathematics score. This analysis showed a definite trend that girls regardless of the variables scored less than their male counterparts. The Table given below makes clear the findings.

Table 15
Gender Gaps in the Achievement of Mathematics by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
Girls on average scored relatively lower than boys in primary grades except in 2059. This year, in lower secondary grades, girls scored more than boys. In secondary level, none of the girls were ahead of the boys in their score and none of them had taken math in higher secondary level education.	In Terai, girls consistently secured lower marks than boys in all four levels of school education. But the hill was different. In this region, girls obtained better scores in higher secondary level. And, in other cases, girls always scored low in Mathematics. In other words, girls from the primary, lower secondary and secondary levels always lagged behind boys in Math. In the case of mountain region, girls were behind boys in Math in primary	Brahman and Kshatri girls always scored less than boys in all four levels. But, in the year 2058, they obtained better position in higher secondary level. Primary school girls of <i>Janajati</i> community were found ahead of boys in Math. The exception was observed in the year 2059. Regarding the girls of lower secondary and secondary levels, it was found that they all scored lower. But the case of girls studying in higher secondary school was different in one case. For example, girls of 2059 academic year scored	In Kaski girls remained low achievers right from primary to secondary level. But the data were not comparable from a gender perspective in higher secondary level. The same finding is true in the case of girls from Kailali. In other words, girls were low achievers from primary to secondary levels. The case of Rasuwa district was

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
	grades but they were high achievers in lower secondary and secondary levels. But in 2058 academic year, girls scored higher marks than their male counterparts in higher secondary level.	<p>higher than boys in Mathematics. But in other years they lagged behind boys.</p> <p>Newar girls showed another picture. They, for example, were better than boys in primary level (except in the year 2058). But they were behind the boys in lower secondary and secondary levels. But except in the year 2060, Newar girls scored higher than boys in higher secondary level.</p> <p><i>Dalit</i> girls on the other hand always remained low achievers right from primary to higher secondary level when compared to their male counterparts. So was the case with girls from Terai caste groups. Girls from Terai caste groups were better in higher secondary level but this was only in the academic year 2058.</p>	also the same. But in only one case (in the year 2058), girls of this district scored higher than boys.

The above Table indicated that Math was indeed the most difficult subject for girls irrespective of their geographic locations and caste or ethnic backgrounds. The situation was worse in lower secondary and secondary levels. One of the reasons is that the lower secondary and secondary levels have received negligible inputs as compared to the primary level. This situation made it clear that (a) teachers need to have an understanding of ‘ethnomathematics’ (giving importance to interaction between human culture and Mathematics) to facilitate girls’ learning (b) they also need technical know-how for linking classroom Mathematics with girls’ lived Mathematics such as math of the *doko* (big wicker-basket to carry loads consisting of geometric constructions such as triangle, square, circle, rectangle, and right angle. And, the illiterate people of specific caste like Dum of Terai and ethnic groups like Sunuwar and Magar do such wickerwork, and (c) girls need to get over their math phobia. Teachers and teacher trainers can work together to help girls do better in STE. Teachers can apprise the trainers of the girls’ styles or ways of knowing and learning.

Gender gaps in Computer Education: Computer education is a new subject in most of the studied schools. However, this study has gathered some information about the achievement of girls and boys in this subject. An analysis of the marks obtained by students in 55 schools in computer education shows no definite trend. Putting it simply, in some years and in some grades, girls have achieved higher marks, but in other years, they have lagged behind. However, no boys or girls took this subject in grades XI and XII in the studied schools. The Table below shows the inconsistent trend.

Table 16
Gender Gaps in the Achievement of in Computer Education

Grade	Year	Total	Boys	Girls
4	2058	35.05	35.59	34.5
	2059	26.46	27.22	25.7
	2060	33.09	32.08	34.1
5	2058	27.45	25.98	28.93
	2059	42.83	45.38	40.28
	2060	33.01	31.3	34.73
6	2058	45.01	41.77	48.24
	2059	49.33	49.8	48.87
	2060	41.44	41.6	41.27
7	2058	51.07	48.25	53.89
	2059	55.39	50.66	60.12
	2060	44.23	45	43.46
8	2058	43.29	43.83	42.75
	2059	46.76	46.1	47.43
	2060	40.82	43.82	37.83
9	2058	44.45	46.37	42.53
	2059	42.43	43.87	40.98
	2060	44.75	45.43	44.06
10	2058	57.09	51.3	62.88
	2059	61.04	62.99	59.1
	2060	61.99	63.33	60.65

An analysis of the Table above reveals a gender gap in Computer score. But it does not show that boys are good at it either. In other words, boys, too, were low achievers. This implies that (a) access of computer was inadequate to the students (b) even if there was any access to it at all, boys would seize upon it. It was partly because of their domineering nature and partly because they could spend more time on it, (c) girls had, like in Math and Science, little time to sit at the computer (d) most of the parents, teachers and girls themselves viewed girls' role merely as a homemaker (e) girls were hesitant to even touch the computer since they feared it will explode in case they make any mistakes. Boys on the other hand found themselves computer-friendly, (g) girls were found waiting for the order of their teachers to boot computer while the boys were found starting right away. This signifies that our very socialization process has made them obedient and less assertive to the extent that they wait for the teachers' order even to boot the computer and, hence, hence the gap between them and the boys. The Table below shows the situation.

The regionwise, caste or ethnic groupwise and districtwise performance of girls in Computer Education is given in the following Table.

Table 17
Gender Gaps in the Achievement of Computer Education by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
<p>Generally girls obtained higher scores in primary level but they failed to do so in lower secondary and secondary levels.</p>	<p>Terai girls scored more than the boys (except in 2059 academic year) in primary grades. In lower secondary level, girls scored higher in 2058 academic year. But the secondary level girls from the same region scored slightly lower than their male counterparts.</p> <p>None of the selected primary grades of the hill region had access to computer education. But the girls of lower secondary level were slightly ahead of the boys in this subject. And in 2058 academic year, girls achieved higher scores in secondary level. But the case was just the opposite in other two academic years. In the case of the mountain region, no one was taking Computer education in primary level. In lower secondary and secondary levels, boys and girls obtained almost equal marks in this region.</p>	<p>Brahman and Kshatri girls of primary level were ahead of boys except in 2060. In the lower secondary level also, girls scored higher than boys. But in 2060 academic year, the girls obtained slightly less than their male counterparts. So was the case with girls of secondary level.</p> <p><i>Janajati</i> girls had no comparable data from a gender perspective for primary level. But the data from lower secondary and secondary levels suggested that these girls scored higher. They, however, scored lower in lower secondary level in 2059 academic year.</p> <p>The Newar girls were low scorers than boys especially in lower secondary and secondary levels. So was the case with Terai girls of primary and lower secondary schools (except the year 2060). The same situation was noted with <i>Dalit</i> girls who lagged behind boys. But in 2059 academic year in primary and lower secondary levels, they scored better. Similarly, in 2058 academic year, they scored higher in secondary level.</p>	<p>None of the girls from Kaski took Computer education. But in the case of Kailali, primary school girls were ahead of boys in the subject. They were also ahead of boys in lower secondary level (with exception in 2060 academic year). Regarding the girls of secondary level, they scored less than their male counterparts in 2059 academic year. But in the selected schools of Kailali no girls took the Computer education.</p> <p>The girls from Rasuwa obtained almost the same score as their male counterparts. In other words, there was no significant difference between the scores obtained by boys and girls in lower secondary and secondary levels.</p>

The Table above indicates that very few girls had access to computer education. It was partly because the schools were too poor to afford it and partly because the teachers were unaware of the importance of computer learning. But in times when girls had access to computer education, they, on many occasions, proved almost as competent as boys. Of course, some girls did score less than their male counterparts. And, this was just because of lack of access to computer facilities at home and school. At home, there is no question of them having a computer because of their poor economic condition, and at school they were given less chances to use it. It is

because they are smaller in number and are bullied by boys. Moreover, school had not enough computers.

Gender gaps in Science: Daily science and classroom science were found hardly bridged in the observed schools. In other words, science teachers were linking day-to-day scientific knowledge or “experiential science” with the curricular knowledge. But they were not trying to link the mythical science with the classroom science. It is where girl students who were heavily engaged in domestic world faced difficulties. There were some problems the girls were facing in science education. They included (a) girls’ inadequate access to science lab (b) boys’ high handedness in lab work and classroom interactions (c) gender-insensitive behavior of teachers, and (d) limited ceiling in terms of career growth of girls. The Table below presents gender disparity in science achievement.

Table 18
Gender Gap in the Achievement of Science

Grade	Year	Total	Boys	Girls
4	2058	39.66	40.55	38.77
	2059	41.02	41.7	40.34
	2060	40.95	41.61	40.28
5	2058	41.38	42.24	40.52
	2059	41.68	42.22	41.14
	2060	43.84	43.63	44.04
6	2058	37.65	38.73	36.58
	2059	37.62	38.49	36.76
	2060	36.96	37.82	36.1
7	2058	39.36	39.68	39.05
	2059	41.11	41.79	40.43
	2060	40.77	41.37	40.17
8	2058	36.54	37.95	35.13
	2059	36.7	37.44	35.96
	2060	36.7	38.31	35.1
9	2058	34.28	35.36	33.19
	2059	35.67	36.96	34.38
	2060	35.88	37.14	34.62
10	2058	40	41.48	38.52
	2059	43.39	45.64	41.15
	2060	41.22	42	40.45
11	2058	39.56	39.15	39.96
	2059	43.63	39.61	47.65
	2060	42.43	38.77	46.09
12	2058	48.62	49.35	47.89
	2059	49.69	48.93	50.45
	2060	43.84	42.25	45.43

The Table above indicates that girls obtained lower marks in Science than their male counterparts particularly in primary, lower secondary and secondary levels. This finding

helped support the fact that science is “difficult” for girls. This also supports what Schwedes (date not available) found in her study, though done in a different context, in Germany. Schwedes found no significant difference in the scores obtained by boys and girls, but the girls were less interested in Science. Their interests, she said, declined as they grew older. This apart, science was considered as a boys’ subject rather than of girls. Such notion is likely to contribute to decreasing girls’ interest in Science. Girls were better in botany, zoology and astronomy than in physics and chemistry. The reason was that these subjects were somehow related to their daily life. Girls, for example, felt botany easy because they were supposed to collect firewood and fodder which are the subjects of botany. Yet another reason could be that the teachers never bothered to take any practical examples out of their daily lives while teaching physics or chemistry.

Similarly, girls were found involved in pastoral activities like herding cows which in one way or another were related to zoology. Likewise, the girls who represented rural areas were found good enough to study astronomy because they were knowledgeable about the stars, the moon and their elevation. The reason was that the girls were the ones in the family who were supposed to go to bed late at night but get up early in the morning. They can also read time on the basis of the position of the stars, the moon and the sun. This helped the girls understand astronomy. This finding also corresponds with the findings of Schwedes. She claimed that the girls may not have interests in many topics of physics but they become “interested in exploring the social implications of physics as they grow older and become more and more affected personally” (p. 3). Schwede’s study conducted in Germany also found the girls more “interested in natural phenomena, like weather, rainbow or the eclipse of the moon” (p. 3). There were science exhibitions which encouraged girls to study science but they were not getting adequate support from their parents and encouragement from the teachers. However, there were some girls whose parents, teachers and male counterparts supported them to study science as future career. Girls did not have enough time or support or encouragement. They also did not have role models, and awards to go further in search of scientific knowledge. These findings help us understand that the way science is taught in schools does not go the way the girls live in the villages or in city centers. The scenario of three geographical locations, caste/ethnicity composition, and district variation tells another story. The following Table presents them in a nutshell.

Table 19
Gender Gap in the Achievement of Science by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
<p>Girls are ahead of boys in Science in primary, lower secondary, secondary, and higher secondary levels.</p>	<p>This study found that girls from Terai scored less than their male counterparts from primary to secondary level. But in the case of higher secondary level, they scored higher in 2059 and 2060 academic years.</p> <p>In the hills, girls obtained high score (except in 2060 academic year). But they lagged behind in lower secondary and secondary levels. And when they entered the higher secondary level, they again scored higher than their male counterparts.</p> <p>The girls from mountain region scored higher than boys in primary level (except in 2058 academic year). But they lagged behind in lower secondary and secondary levels. And none of the girls enrolled in science in higher secondary level in the mountain region.</p>	<p>Dalit girls obtained lower score in primary to higher secondary level. But there was an exception in the higher secondary level result of 2058 academic year. In other words, <i>Dalit</i> girls scored higher that year.</p> <p>Girls from Terai caste groups obtained lower scores in primary and lower secondary levels. But they scored higher in secondary level. And, interestingly, girls of the higher secondary level were also found to be low achievers.</p> <p>Newar girls from primary and lower secondary levels were ahead of boys in Science. But the girls in secondary and higher secondary levels obtained lower score (except in 2058 academic year in higher secondary level).</p> <p><i>Janajati</i> girls were ahead of boys in 2059 and 2060 academic years. They scored higher in secondary level as well in 2058 and 2060 academic years. But in general they secured low score in lower secondary and secondary levels.</p> <p>Brahman and Kshatri girls obtained low score in science from primary up to secondary level. But they obtained relatively better score in higher secondary level except in the year 2058.</p>	<p>In Kaski district, girls scored higher than boys in primary level. But they lagged behind in lower secondary and secondary levels. The case of Kailali district was different in the sense that girls scored higher in primary and also in higher secondary levels (except in 2058 academic year). But they scored less than boys in lower secondary and secondary levels.</p> <p>In Rasuwa as well, girls scored higher than boys in primary grades (except in 2058 academic year). But the girls of lower secondary and secondary levels obtained less than boys. And in higher secondary level, there were no girls in science faculty in the selected school.</p>

The Table above shows different trends in Science. One, girls in primary grades scored higher but as they reach higher classes, they tend to get lower marks and this continues till the higher secondary level. Two, girls of *Dalit* and Terai caste groups were weaker in Science than in other girls. Three, girls got high pass percentage in earlier grades partly because of their ability and partly because of the “grace culture.” But they scored lower as they moved higher up and it was partly because of their heavy domestic workloads and partly because girls, as Schwedes said, begin to lose their interest in Science with the increase in age. Four, both teachers and students have difficulty in linking lived science with the “academic science.” Five, the phobia that Science is a difficult subject which the girls usually suffer from might have also contributed to their low performance.

Gender gaps in Health and Physical Education: Unlike in other subjects, girls in Health and Physical Education scored better than their male counterparts. This situation spells out many things. One, Health and Physical Education is basically a life-related subject and girls took more interest in it. Two, this is basically a practical subject so teachers were liberal in giving marks. Three, teachers gave marks to each and every activity the girls performed in school. Four, girls found this subject interesting because it provided both freedom and enjoyment during teaching and learning. Five, boys were not serious and “obedient” in this subject but girls were. Against this background, girls’ achievement in Health and Physical Education is displayed in the following Table.

Table 20
Gender Gaps in the Achievement in Health and Physical Education

Grade	Year	Total	Boys	Girls
4	2058	27	26	27
	2059	27	26	28
	2060	26	25	26
5	2058	28	28	28
	2059	29	29	29
	2060	28	27	29
6	2058	26	25	27
	2059	30	25	35
	2060	22	22	23
7	2058	26	26	27
	2059	34	31	37
	2060	24	26	23
8	2058	21	23	19
	2059	35	36	34
	2060	21	22	20
9	2058	0	0	0
	2059	0	0	0
	2060	30	0	60
10	2058	0	0	0
	2059	0	0	0
	2060	34	69	0
11	2058	23	22	23
	2059	12	23	0

Grade	Year	Total	Boys	Girls
	2060	12	24	0
12	2058	0	0	0
	2059	0	0	0
	2060	23	24	23

Note: 0 score indicates that none of the boys and girls took health and physical education.

The scores in question were cross-checked with classroom and playground observation and interviews with both boys and girls. These processes identified girls' enthusiasm in the subject. But they had some hesitations as well especially in physical education part. They were (a) physical education demanded the kind of dress they didn't have. On top of this, most of the girls found the gender-specific dress restricting their movement (b) some of the boys teased girls for their body movement especially when they were running or jumping, embarrassing them. Despite all these inconveniences, girls scored relatively better in Health and Physical Education.

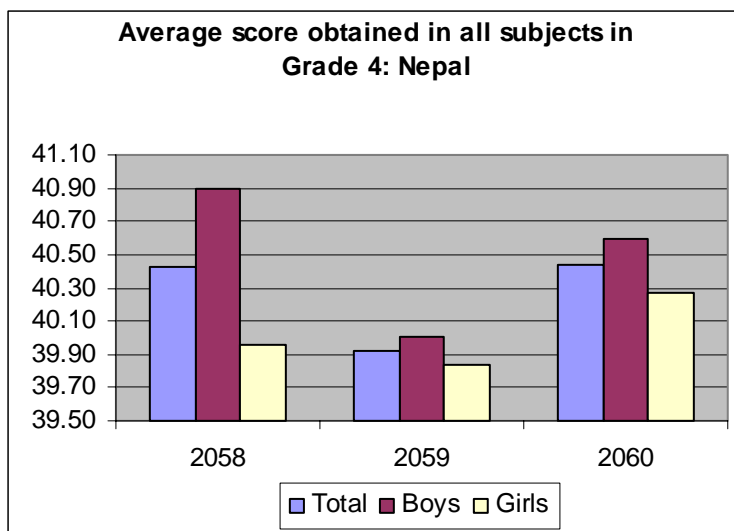
The scenario of three geographical locations, caste/ethnic groups and districts tells a different story. This is presented in the following Table.

Table 21
Gender Gap in the Achievement of Health and Physical Education by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
Girls of primary and lower secondary levels score higher in Health and Physical Education. But in higher grades, they lagged behind boys.	Girls from Terai were ahead of boys in primary level (except in the year 2058) and in secondary school (except in 2059 academic year). The girls from hills also obtained higher score than their male counterparts in primary level but were behind in lower secondary level (except in 2058 academic year). And in other levels, girls obtained lower scores than boys. In the case of mountain girls as well, they obtained higher scores in primary level. They	<i>Dalit</i> girls were also found ahead of boys in primary and lower secondary levels but they lagged behind in higher secondary level. Girls of Terai castes obtained higher scores than their male counterparts in primary level (except in 2058 academic year). But the girls from lower secondary level were lagging behind in 2059 and 2060 academic years. This trend continued in other levels as well. Newar girls obtained better scores than boys in primary level. So did they do in lower secondary school (except 2060 academic year). But there was no comparable data for secondary and higher	Girls from Kaski secured better scores than the boys in primary level. But there were no girls taking health and physical education courses in secondary and higher secondary levels. In Kailali district, girls obtained higher score than the boys in primary level. But the girls of lower secondary and secondary levels lagged behind. In other words, they scored less than the boys of lower secondary and secondary levels. The case of Rasuwa district was different. Girls of lower secondary and secondary levels were ahead of the boys in this district.

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
	were ahead of boys in lower secondary level (except in 2058 academic year). But in secondary level, they scored lower than the boys.	<p>secondary levels.</p> <p>Unlike earlier findings, <i>Janajati</i> girls of primary level scored less than their male counterparts in health and physical education in 2058 and 2059 academic years. But the girls of lower secondary level were ahead of boys (except in 2058 academic year). In the case of secondary level, there was no data to compare.</p> <p>Brahman and Kshatri girls obtained higher scores in primary grades. They could do so in lower secondary school as well (except in 2060 academic year). But in secondary level, they obtained lesser scores than boys.</p>	

The Table given above shows that Health and Physical Education is easier for girls of different categories. This also shows that girls' inhibition to jump in front of boys and to study topics like reproductive health might have contributed to their low scores in the subject, especially in higher grades. Similarly, the analysis of caste/ethnic composition provided the knowledge that girls of *Dalit* and *Janajati* scored lower than the girls of other caste and ethnic groups. The following chart of grade 4 provides an example (Appendix 10) of it.



The above figure clearly states that the girls of the so-called higher caste (Brahman/Kshatri) scored more than the girls of the so-called lower caste (*Dalit*). Similarly, Newar ethnic group scored more than other *Janajati* groups. These findings provide the knowledge that achievement score followed caste line in the case of Brahmans and *Dalits*, urban settlement line in the case of Newar ethnic group, and generational line for both Brahman and Newar. Some explanations can be drawn in the case of the girls scoring higher. For example, girls of these caste and ethnic groups might have elder siblings to provide them tutorial support, these caste/ethnic groups of the people are relatively aware of the education for girls, they are comparatively richer to finance the education of their girls, and they might have seen STE related career prospect for girls partly because of their exposure to outside world and partly because of their knowledge of role models.

Additionally, the caste/ethnic compositions of girls provided the knowledge that the girls of the so-called high caste scored high. Newar girls, for example, scored more than their Terai and other counterparts in Population and Environment Education. But, in Mathematics, girls of the Brahman and Kshatri caste groups were ahead of Terai and *Janajati* girls. In Computer, Brahman and Kshatri girls scored higher than other groups of students. The result of Science was different in the sense that Newar girls outnumbered others and girls from Terai followed them. But, in physical education, Newar, Brahman and Kshatri girls scored almost the same marks while *Janajati* girls lagged behind. These findings repeatedly give the message that Brahman and Newar girls were comparatively high achievers, whereas *Janajati* girls are at the lowest rung.

Gender gap in pass percentage: Unlike the obtained scores in STE related subjects, girls were found securing high rates of pass percentage. The pass percentage did not follow a definite trend. However, one can easily understand that girls, given an access to STE, can demonstrate their performance as well as their male counterparts. Going through the qualitative information gathered during the course of the study, one could argue that girls got “grace score” and that might have helped increase their pass percentage. But there comes a question- is it possible for all the students of the 55 schools covered by the study to receive such grace marks? The Table presents the exemplar pass percentage of the boys and girls in population and environment subjects.

Table 22
Gender Gaps in Pass Percentage of Population and Environment Education

Grade	Year	Total	Boys	Girls
4	2058	83.93	83.56	84.3
	2059	85.41	82.68	88.14
	2060	89.3	90.2	88.4
5	2058	86.65	88.92	84.38
	2059	89.8	88.03	91.58
	2060	86.81	85.62	88
6	2058	16.42	17.44	15.4
	2059	17.94	19.32	16.56
	2060	17.22	17.86	16.58

Grade	Year	Total	Boys	Girls
7	2058	21.83	22.17	21.48
	2059	20.35	22.05	18.66
	2060	20.24	21.6	18.87
8	2058	25.59	28.62	22.57
	2059	20.25	21	19.51
	2060	20.32	21.75	18.88
9	2058	88.94	89.24	88.64
	2059	88.2	88.56	87.83
	2060	94.18	94.12	94.24
10	2058	95.81	96.73	94.89
	2059	94.65	95.18	94.13
	2060	82.75	83.51	82
11	2058	82.24	75	89.47
	2059	77.88	81.43	74.32
	2060	80.89	81.88	79.89
12	2058	95.45	90.91	100
	2059	94.44	100	88.89
	2060	96.48	100	92.96

An analysis of the Table above reiterates the findings of the qualitative study that girls, if given opportunities, can be as competent as boys; girls, if taught by enabling them to learn things through their lived experience and theorize them later, can learn easily; and if boys are ready to share girls' workload at home, it will help them score better in the subject, thereby raising their pass percentage.

Like in Population and Environment, there was gender gap in the pass percentage of Math, Science, and Health and Physical Education also. These gaps, however, did not show a definite trend (Appendixes 9 a, b, c, d and e). For example, in Mathematics (grades 5 and 8 of 2058 and grades 6 and 7 of 2059), girls obtained more pass percentage than boys, while in others, they lagged behind. But, in Computer education, no significant difference could be noticed partly because the number was too small to be compared and partly because only girls and boys who had aptitude for technical subjects like computer or had support from their homes or who were already better took this subject. In the case of Health and Physical Education, girls had higher pass percentage than boys in all the studied grades. To one's astonishment, this study found girls' pass percentage higher than boys' in Science also except in grade 4 of 2058 academic year. The analysis of the caste/ethnic composition also reiterates this finding. For example, Newar girls had better pass percentage in population education. Terai girls were next to Brahman and Kshatri girls. But they had better pass percentage in Math and Science. *Janajati* girls had low pass percentage in both Math, and Population and Environment Education. Similarly, Brahman and Kshatri girls had better pass percentage in Computer. But Brahman girls were ahead in Health and Physical Education and the Terai girls were the last. The following Table presents the details.

Table 23
Gender Gaps in the Pass Percentage of
the Population and Environment Education by Different Categories

Overall	By Region	By Caste/Ethnic Group	By District (exemplar)
<p>Primary school girls obtained higher pass percentage than the boys in the population and environment education. But in lower secondary level fewer girls passed than the boys (except in 2060 academic year).</p>	<p>Terai girls of primary grades had higher pass percentage than boys (except 2058 academic year). So was the situation with the girls of lower secondary and secondary levels (except in 2059 academic year). But in the case of girls of higher secondary level, their pass percentage was lower than boys (except in 2058 academic year).</p> <p>Like in Terai, pass percentage of hill girls was higher in primary level (except in 2058 academic year) but the percentage was lower in lower secondary level (except in 2059 academic year) and secondary level (except in 2060 academic year). And the case was reverse in higher secondary level. In this level, girls had higher pass percentage than the boys (except in 2060 academic year)</p> <p>The mountain girls on the other hand had higher rate of pass percentage than the boys from primary to higher secondary levels.</p>	<p><i>Dalit</i> boys had higher pass percentage in primary through higher secondary level. In other words, girls had low pass percentage than the boys in this caste group. But the case was different with Newar girls. They had better pass percentage in primary (except in 2058 academic year), lower secondary and secondary levels (except in 2058 academic year). But fewer girls passed in higher secondary level as compared to the result of the boys.</p> <p><i>Janajati</i> girls had higher pass percentage in primary level (except in 2058 academic year), but they had lower pass percentage in lower secondary level. In secondary level as well, girls' pass percentage was low (except in 2058 academic year). But the girls had higher pass percentage in higher secondary level (except in 2059 academic year).</p> <p>Brahman and Kshatri girls had also higher pass percentage in primary grades and with an exception of the year 2059, girls had higher pass percentage in lower secondary level as well. But in the secondary (except in 2060 academic year) and higher secondary levels, (except in 2058 academic year) their pass percentage was relatively low.</p>	<p>Girls of Rasuwa district had higher pass percentage than the boys of primary, lower secondary, secondary and higher secondary levels. So was the case with the girls of Kailali district. However, there was an exception in 2060 academic year. This year, fewer girls passed primary grades.</p> <p>Girls of Kaski district had different story. They were ahead of boys in pass percentage in primary level (except in 2058 academic year). But the girls of lower secondary level had lower pass percentage than boys (except in 2059 academic year) and secondary level (except in 2060 academic year). But the girls were ahead of boys in pass percentage in higher secondary level in Kailali.</p>

The above Table can be interpreted in several ways. As the number of girls was relatively small, it might have helped raise their pass percentage and the tradition of “asking for and giving grace marks” might have its impact on the raised percentage. The girls who were at school might have the ability to secure pass percentage but they might have failed in obtaining higher score as compared to the boys. Besides, cultural forces (capitals) could have also contributed to the pass percentage of the girls. For example, Terai girls who belonged to Yadav and Tharu communities had better pass percentage than the *Janajati*, Brahman and Kshatri girls but they had low pass percentage in Health and Physical Education. The reason could be that the girls in Terai were found relatively more restricted than the girls other communities and, therefore, were getting lower rates of pass percentage in the subject which demands their physical involvement. Besides, they are required to learn topics that are not culturally relevant to discuss about.

Chapter Findings

Girls in lower grades secured higher score. But as they reach higher grades, they face many domestic responsibilities and personal issues brought about by biological changes. Such factors were very likely to cause their lower score. The next finding was that girls obtained better score in the practical subject and/or the subjects that were known to them. They, for example, found astronomy, zoology and botany easier than chemistry because the teachers taught them taking practical examples taking from their life. Even the girls were found able to share their lived experiences associated with astronomy, biology and zoology. The third finding was related to the availability of the time for preparation and the obtained score. For example, Population and Environment Education did not demand more time as did Science and Mathematics. In other words, girls obtained more score in the less demanding subjects than more demanding ones. The fifth finding was that more girls obtained higher pass percentage than boys. Similarly, girls of the higher caste (Brahman) and ethnic group (Newar) scored more than the girls from so called lower caste (*Dalit*) and ethnic group (*Janajati*). Their pass percentage was also higher.

Chapter VI Major Findings, Conclusions and Measures

Major Findings

The findings of this study are presented in four broad areas, viz. knowledge obtained from literature about girls' access to education, field findings about the promoting forces, hindering forces for girls' education and gender gaps. The following paragraphs present a rundown of these findings.

Knowledge obtained from literature review

The literature review provides three major findings. One, gender parity index shows that disparity exists in many aspects of the life of girls and women. And educational disparity can be understood as a fall-out of these very discrepancies. Two, though efforts were made to promote gender equity, curricular materials were found perpetuating these disparities in the form of "as it stands in the society." In other words, "gender-blind social construct" was reflected in the curricular materials. Three, no deliberate efforts have been made to mainstream gender in curricular materials. However, efforts have been made to ensure gender parity in education by providing scholarship, stationary and textbooks support, and organizing parental awareness sessions.

Promoting forces for girls' education

Basically eight forces were found promoting girls' access to and participation in STE subjects. They were: social recognition of girls and their parents; high career expectations of the girls and their parents; encouragement given to the girls by their teachers, parents and elder siblings; presence or examples of STE related role model girl or women; increased physical facilities in schools; tutorial support; increased competition between girls and boys; and the provision of material awards for the best performing girls in the form of scholarship, medals and stationary supports.

Hindering forces for girls' education

Similarly, nine hindering forces were identified regarding girls' access to and participation in STE subjects. They were: cultural values and beliefs that required girls for birth, marriage and death ceremonies; extreme cultural practices which either encouraged the girls to serve drinks and be part of the entertainment or restricted them from mixing up with males; subsistence agrarian lifestyle which required children for work; culture of virgin marriage; theoretically oriented and practically unlinked pedagogical approach; culturally imbedded girls' inhibition to ask question with teachers; culture of grace marks; gender-biased attitude of boys and other males towards girls' work world and career growth; and only one way of classroom seating arrangement.

Gender Gaps

Gender gaps were found in various forms. Girls in the lower grades, for example, secured higher score. As they reached the higher grades, they faced many domestic and personal problems that might have contributed to their lower score. The next finding was that the girls obtained more score in the practical subjects or the subjects that were known to them. For instance, they found astronomy, zoology and botany easier than chemistry partly because the teachers provided practical examples taken out from their lives and partly because they could share their lived

experiences associated these subjects. The third finding was related to the availability of the time for preparation of these subjects and the obtained score. For example, Population and Environment Education did not require much time as Science and Mathematics did. In other words, girls obtained more score in less demanding subjects than in more demanding ones. The fifth finding was that more girls obtained higher pass percentage than boys. Similarly, girls of the higher caste (Brahman) and ethnic group (Newar) scored more than the girls from so called lower caste (Dalit) and ethnic group (*Janajati*). Their pass percentage was also higher.

Conclusions

The reflections over the chapter findings, literature review and data analysis helped draw the following conclusions from this study.

1. Realist parents and bookish teachers: Parents are more realistic about their girls' "reformed or expanded ceiling in terms of academic and professional life" that consists of (a) simple literacy of girls (b) certificate to prove educational qualification of the girls (c) marriage of girls with parents' consent or decision (d) easy and better life for girls, and (e) hope that STE subjects will ensure better earning and independent living of the girls in the future. But the teachers pushed girls to their "bookish future." This future comprises (a) rote learning (b) grade promotion, and (c) better qualification. Because of the difference between the girls' "reformed or expanded future" aspired by the parents and "bookish future" prescribed by the teachers, girls hardly developed their career. This implies the gap between the expectations of teachers and of parents from girls' involvement in STE. In other words, parents are gradually changing their traditional expectations in terms of their daughters' roles but the teachers on the other hand could not capitalize on the parents' expectation to motivate and facilitate girls' STE learning. Teachers rather focused on traditional bookish or scholarly knowledge which hardly helped girls perform better.
2. Negotiated girls' ceiling in STE education: Though girls have developed "reformed or expanded career expectation" set by the parents, they were aware of the traditionally restricted social mobility for them. This is why, girls created their ceiling in terms of STE learning and turned less inclined towards STE related career.
3. Absence of hard technology i.e. overhead projector and multi media and/or experience in teaching STE subjects: A link is yet to be established between girls' lived experience and teaching environment to make STE easier. Continuation and strengthening of excursions, exhibitions, project work, experiential teaching and learning and use of hard technology initiated by some of the teachers in the Population and Environment Education and Science will ensure access of girls to STE.
4. Missing link between "STE phobia" of girls and intelligent minds as required by teachers for STE: Girls developed STE phobia and teachers wanted "intelligent students". This missing link was further aggravated by the social belief that STE is a subject only for boys.

5. Different cultural capitals showed different STE results: Diverse socio-cultural abilities, caste/ethnic orientations and gender socialization brought different cultural capitals in schools which promoted or hindered girls' access to STE. But the teachers were not adequately trained to use these capitals in STE. Consequently, only best girls were promoted by the teachers and parents for STE subjects. Therefore, the result showed lower gaps between the scores of boys and girls in Computer education and between their performances at primary and higher secondary levels. It also showed the girls' better score in experientially learnt STE subjects like Population and Environment Education, their low scores in Mathematics and the relationship between caste/ethnic and gender orientation of girls and their scores in STE subjects. The result also showed the relationship between the physical and emotional development of girls and their achieved scores in STE subjects e.g. high score in Health and Physical Education in primary grades and relatively low score in higher grades. This applied to other subjects as well.
6. Difficulty in STE subjects followed a continuum: Girls felt difficulty in Math, Science, Health and Physical Education, and Computer. This continuum though loosely constructed helps understand the requirement of STE learning support for girl students and teaching support for teachers. *Dalit, Janajati* and girls of Terai caste groups need more attention.
7. Role models help girls pursue STE career: Girls of diverse cultural, caste/ethnic, and topographical backgrounds learnt to expand their ceilings from the models. In this respect, creation of role models and roster of women and girls actively participating in the field of science and technology is urgently required.
8. Girls' shyness contributed to their low achievement in STE related subjects. Social orientation to perform gender roles trained girls and boys in different directions. These differences in orientation nurtured "outgoing nature and ego" in boys and "obedience" in girls which adversely affected the latter's access to STE subjects.

Gender Equality Measures

Three decades ago, the Ministry of Education/Nepal introduced a gender equality initiative in association with UNESCO. This initiative was confined to primary education support only. The current programs especially for scholarships, stationeries and book support, and advocacy to the parents are the continuation of the same initiative. These continued initiatives can be seen in EFA document (Appendix 8) as well. However, these initiatives, too, are confined to primary level only. Besides, there are some other efforts being made under SESP to ensure gender parity and equality in lower secondary and secondary levels (Appendix 8). This study has also in one way or the other reiterated the earlier measures. It also came up with different measures aimed to ensure girls' access to and participation in STE subjects as well. It identified the issues to be resolved, figured out the areas of intervention to ensure gender equality in STE subjects, and came up with a tentative action plan. Though the following Table presents specific measures for the study districts, they can be replicated or adapted in other districts as well. The suggested measures given in the Table below in an elaborated way can be initiated in the study districts as an action research project and can be expanded further to other districts of the country also.

Table 24
Proposed Gender Equality Measures for STE

Issues to be Resolved	Districts to be Focused	Areas of Intervention	Tentative Actions
Inadequate school support	Ilam, Doti, Panchthar, Mustang, Kathmandu valley, Kaski, Palpa, Rasuwa, Banke, Siraha,	School	<ul style="list-style-type: none"> ○ Tutorial support for STE subjects ○ Practical homework to girls to learn STE subjects ○ Individual assignment ○ Development of STE audio video cassettes and WebPages
Lack of learning culture at home	Ilam, Palpa,	Home culture	<ul style="list-style-type: none"> ○ Parents' orientation ○ Stakeholders' interactions
Absence of role model girls	Panchthar, Kathmandu valley, Doti, Banke	Roster preparation	<ul style="list-style-type: none"> ○ Development of STE related roster of girls and women ○ Counseling girl students for better role models
Lack of linkage between domestic and STE knowledge systems	Mustang, Rasuwa, Rasuwa, Banke, Siraha,	Relationship between different knowledge systems	Interaction programs between teachers, parents, and local and national experts of different subjects Excursion trips on STE subjects
Theoretically oriented teaching style	Kathmandu valley, Kaski, Palpa Siraha,	Teaching techniques, reflective teaching	<ul style="list-style-type: none"> ○ Reorientation of teachers about different forms of content presentation techniques ○ Use of visual aids on STE subjects ○ Acceptance of different forms of teaching and learning styles ○ Preparation of girl students on questioning techniques
Gender biased outlook of parents, male students and teachers	Kaski	Gender relation	Interaction sessions about different status of children, both male and female, at home and in society, and gender blind, gender biased, gender neutral and gender sensitive approaches to deal with male and female children
Narrow ceiling of the girls and their parents	Kaski	Construction, reconstruction, and deconstruction of individual's ceiling	<ul style="list-style-type: none"> ○ Ceiling expansion programs ○ Different forms of career orientation sessions related to STE subjects ○ Reflection on the implication of gender relations and gender biases in male and female's education

Issues to be Resolved	Districts to be Focused	Areas of Intervention	Tentative Actions
Absence of teacher research and students' experience based project work	Palpa, Rasuwa,	<ul style="list-style-type: none"> ○ Teacher research ○ Students' project work 	<ul style="list-style-type: none"> ○ Interaction sessions on teacher research ○ Interaction session with students' project work
Lack of encouragement and awards for STE career pursuing girls and teachers	Palpa, Rasuwa,	Incentive schemes for students and teachers	Development and implementation of local, district and national incentive schemes on STE subjects
Inadequate STE lab and library facilities	Kailali, Rasuwa,	STE lab and library facilities	Lab/library improvement programs
Communication problem	Banke	Language switch-over in a smooth way	<ul style="list-style-type: none"> ○ Language switch-over orientation sessions for teachers ○ Cultural STE sessions and/exhibitions
Lack of interactive monitoring/ supervision systems	Siraha	Collaborative and/collegial monitoring system	Exercises and orientation on collegial monitoring systems
Biological and psychological changes in girls during adolescent period	All districts	Counseling	Cooperation with NGOs to provide counseling at school levels.
Incorporation of locally acquired STE knowledge and skills of the girls in school curriculum	All districts	Initiation of local curriculum and readjustment in teacher training programs accordingly	<ul style="list-style-type: none"> ○ Preparation of teachers, SMC members and local elites for the development and use of local curriculum in STE subjects ○ Reorientation for the teachers about the use of STE knowledge and skills of the girls in classroom teaching
Periodic revision of curricular materials	-	Primary to higher secondary level STE curriculum	<ul style="list-style-type: none"> ○ Development and use of gender frame in revising the curriculum ○ Update of curriculum according to changed context and changed roles of men and women ○ Orientation for gender sensitization included in subject specific teacher training ○ Involvement of both men and women in curriculum development process ○ Institutionalization of curriculum revision process ○ Assessment of gender sensitive student
Adjustment of textbooks in line with curriculum	-	Primary to higher secondary level STE textbooks	<ul style="list-style-type: none"> ○ Development and use of gender frame in revising the textbooks ○ Inclusion of gender experts

Issues to be Resolved	Districts to be Focused	Areas of Intervention	Tentative Actions
			in review team to ensure elimination of androcentric biases
Readjustment in STE policy and planning	Policy and implementation levels	Sharing, reflection, and readjustment sessions	Gender sensitive policy and planning workshops for shared readjustment in STE subject specific issues

The Table above presents six areas of work to ensure improvement, access and participation of girls in STE subjects. The first is to change the socio-culturally oriented gender biased mindset. This area requires reorientations for parents, teachers, boys and girls, and parent-figures to become gender sensitive. The second area is concerned with pedagogical reform. This reform consists of:

- Introduction of project work for girls that depict their work world
- Preparation of teachers to theorize the findings of project work by linking them with the knowledge to be imparted through STE subjects
- Encouragement to girls for collegial and individual learning.

Similarly, the third area is concerned with development of school based encouragement schemes for girls and pro-girl people. This scheme consists of the model setting for STE learning by:

- Preparing and maintaining roster of role model girls and women in the field of STE that are available at local, national and international levels
- Organizing discussion sessions about the contributions of role model girls and women
- Introducing project work on role model girls and women
- Organizing exhibitions on model works of girls and women at school and in public places

The fourth area is related to school support programs. These programs consist of the following initiatives for the promotion of girls' access to, participation and improvement in STE learning by:

- Developing and supplying STE related basic and advance books, magazines, audio and video cassettes, and e-messages
- Introducing correspondence programs for girls on STE related subjects
- Providing scholarship support for girls
- Providing stationary support for girls
- Equipping STE labs
- Making available library support

The fifth area relates to the expansion of girls' ceiling about their career options on STE subjects. This can be done by:

- Collecting and sharing local, national and international career options related to STE subjects with girls, their parents, male students and teachers

- Involving girls to undertake small initiatives for the support of their future career
- Organizing discussion sessions on career options in STE related subjects

Likewise, the sixth area to be worked out is the reform in curricular materials. This reform consists of:

Preparation and application of local curriculum in STE

Curriculum adjustment to improve girls' participation and performance in STE.

Inclusion of girls' lived experiences in explaining the concept of STE subjects.

Chapter VII Action plan

Concepts need structure to be materialized into action. In this case, local schools are the structures at the grassroots level. At district level, there is DEO to facilitate, coordinate and expedite the process. At the apex level, SESP will take a lead role. Since many of the proposed actions are directly related to girls, their parents, teachers and male classmates, most of the activities are developed for school level initiatives. On this ground, the following action plan has been proposed to ensure girls' access to, participation and improved performance in STE subjects.

Table 25
Action Plan for Girls' Access to and Participation in STE Subjects

Action Objectives	Program	Action Strategies	Responsible Agency
Ensure change of socio-culturally oriented gender biased mindset	<ul style="list-style-type: none"> ○ Reorientations for parents, family members, teachers, boys and girls, and parent-figures to be gender sensitive and work for gender equity. ○ Reorientation for adolescent girls and boys students to help them challenge the cultural views that restrict girls' mobility 	Organization of separate interaction sessions of teachers, boys, girls, parents, community father-figures (male elites) at school levels. In doing so, the orientation providers should bring local examples for discussion and value clarifications.	DEO
Promote teachers for pedagogical reform	Introduction of project works for girls that depict their work world; preparation of teachers to theorize the findings of the project work by linking them with the knowledge to be imparted through STE subjects; and encouragement to girls for collegial and individual learning.	<ul style="list-style-type: none"> ○ Introduction of project work for girls in STE subjects ○ Initiation of teacher research both individually and collectively ○ Introduction of individualized learning programs ○ Reorientation for teachers and head teachers for the use of girl friendly pedagogy 	School teachers and head teachers
Develop school based encouragement schemes for girls and pro-girl people	<ul style="list-style-type: none"> ○ Development of roster of the role model girls and women in the field of STE that are available at local, national, and international levels ○ Organization of discussion sessions about the contribution of role model girls and women 	<ul style="list-style-type: none"> ○ General survey of the RONA- promoted role model girls and women scientists and development of their profiles for wider sharing ○ Group meetings, talk programs and seminars by role model girls, 	DEO and SESP School administration STE teachers Teachers,

Action Objectives	Program	Action Strategies	Responsible Agency
	<ul style="list-style-type: none"> ○ Introduction of project work on role model girls and women ○ Organization of exhibitions on works of girls and women model works at school and in public places ○ Organization of talk programs of the role model girls and women scientists in school and colleges 	<ul style="list-style-type: none"> women, and women scientists ○ Project works for girls on practically experienced STE related subjects ○ Periodic exhibition sessions ○ Promotion of individually and/or group supported scholarship program for girls in STE subjects 	students and head teachers
Ensure school support programs at place	<ul style="list-style-type: none"> ○ Development and supply STE related basic and advance books, magazines, audio and video cassettes, and e-messages ○ Introduction of correspondence programs for girls on STE related subjects ○ Development of scholarship support programs for girls ○ Labs and library support ○ Observation of local technologies and discussion on scientific know how imbedded in them 	<ul style="list-style-type: none"> ○ Promotion of private enterprises for the development, production and distribution of STE related basic and advance books, magazines, audio and video cassettes, and e-messages ○ Collaborative undertakings with DE/OL Division initiatives ○ Development of local scholarship support fund ○ Support to labs and libraries ○ Development of materials that help bridge local and bookish science with technology and vise versa 	<p>Private publishers and other producers</p> <p>DE/OL Division and SESP</p> <p>Local schools</p> <p>Local donations and donor agencies' support</p>

Action Objectives	Program	Action Strategies	Responsible Agency
Expansion of girls' ceiling about their career options on STE subjects	<p>Collection and sharing of local, national and international career options related to STE subjects</p> <p>Involvement of girls to undertake small initiatives for the support of girls' future career</p> <p>Organization of discussion sessions on career options in STE related subjects</p> <p>Organization of girls' field visit followed by reflective journal writing on STE</p> <p>Orientation for girls about STE fields and the options for girls and women in them</p>	<p>Documentation of career options on STE related subjects</p> <p>Initiation of STE career programs</p> <p>Workshops at schools and community levels</p> <p>Creation of STE data base by the Ministry of Science and Technology</p>	<p>DEO, DOE, and SESP</p> <p>School teachers and Head teachers</p> <p>Student clubs</p>
Revision of curricular materials	<p>Periodic revision and readjustment of curricular materials from a gender perspective</p> <p>Use of indigenous STE knowledge in curricular materials, teacher training and pedagogies</p>	<p>Collaboration with academic institutions for periodic monitoring of implementation and implication of curricular materials</p> <p>Mini researches by students on the impact, appropriateness and relevance of curricular materials as part of their academic work.</p>	<p>CDC, Women/Gender Studies Program of Padma Kanya Campus, TU</p>
Contextualization and use of local curriculum to ensure girls' access to, participation and improved performance in STE subjects	<p>Reorientation of the teachers to help them contextualize STE subjects with girls' practical experiences</p> <p>Preparation of local curriculum on STE subjects in collaboration with girls, women teachers, and gender sensitive male teachers</p>	<p>Local workshops with the STE teachers at RC level</p>	<p>RPs and Supervisors</p>

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Appendices

Appendix 1 Method, Tools, Respondents, and Expected Outcomes of the Study

SN	Methods	Tool	Respondents/ Participants	Initial Outcomes
	Document review/survey	Forms	X	Enrollment, subject selection and achievement patterns, and girl students' socio-cultural contexts. Quality, appropriateness and relevance of curricular materials.
	School survey	Forms	X	Basic information Socio-economic status of the community, school background Specific information Enrollment, subject selection and achievement patterns Economic, ethnic and socio-cultural backgrounds of students Parental education STE teacher background
	Empirical study	Individual and group interviews and classroom observation	Teachers, parents and students, both boys and girls	Parental attitude, girls' own attitude towards science, Attitude of teachers and parent figures Documentation of girls' life stories in relation to STE Documentation of parents' and teachers' views and experiences about girl children's access to and participation in STE and ST related jobs. Promoting and hindering forces for the access of girls to STE Lived contexts and contradictions to be managed, and approach to management

SN	Methods	Tool	Respondents/ Participants	Initial Outcomes
	Case study	Observation, questionnaire Individual interviews, story writing	Girl students and their parents, teachers; and women in science and technology related jobs.	<p>Documentation of girls' life stories in relation to STE and documentation of experiences of women in primarily male dominated STE related jobs.</p> <p>In particular, the outcomes include:</p> <p>Observation of the school learning environment Assessment of classroom activities/pedagogies/evaluation processes</p> <p>Assessment of teacher student relationship Assessment of the relationship between male and female students during science classes Evaluation of the counseling services</p>
	Participatory workshop	Large and small group discussions and group works	School teachers, DOE, DEO, SED, CTEVT, CDC teacher educators and NGO	Consensus on promoting girls' participation and achievement in STE. Finalization of action plan.

Appendix 2 Dalit/Ethnic Groups of Nepal

Dalit Groups (Caste Group)	Ethnic Groups		
<p>Hill Dalits</p> <ol style="list-style-type: none"> 1. Gandharba 2. Pariyar (Damai, Darji, Sujikar, Nagarchi, Dholi, Hudke) 3. Badi 4. Biswakarma (Kami, Lohar, Sunar, Od, Chunara, Parki, Tamata) 5. Sarki (Mijar, Charmakar, Bhul) <p>Terai Dalits</p> <ol style="list-style-type: none"> 1. Kalar 2. Kakahaiya 3. Kori 4. Khatik 5. Khatwe (Mandal, Khanga) 6. Chamar (Ram, Mochi, Harijan, Ravidas) 7. Chidimar 8. Dom (Marik) 9. Tatma (Tanti, Das) 10. Dushad (Paswan, Hajara) 11. Dhobi (Rajak) 12. Pattharkatta 13. Pasi 14. Wanar 15. Musahar 16. Mestar (Halkhor) 17. Sarbhang (Sakhariya) 	<ol style="list-style-type: none"> 1. Kisan 2. Jirel 3. Darai 4. Dhimal 5. Mugali 6. Raute 7. Lepcha 8. Dolpo 9. Tamang 10. Thami 11. Chhairotan 12. Thintan 13. Tajpuria 14. Thakali 15. Thudam 16. Dura 17. Pahari 18. Baram 19. Byasi 20. Kumal 	<ol style="list-style-type: none"> 21. Kusunda 22. Gangain 23. Chepang 24. Bankariya 25. Bote 26. Bhote 27. Magar 28. Marphali 29. Rai 30. Raji 31. Limbu 32. Satar 33. Surel 34. Bolu 35. Manange 36. Lhopa 37. Siar 38. Sherpa 39. Hayu 40. Majhi 	<ol style="list-style-type: none"> 41. Meche 42. Rajbanshi 43. Larke 44. Lhomi 45. Sunuwar 46. Syangtan 47. Hyolhmo 48. Chimtan 49. Danuwar 50. Dhanuk 51. Fri 52. Baragaunle 53. Bhujel 54. Kusbadia 55. Gurung 56. Chhyantyal 57. Jhangad 58. Tangbe 59. Topkogola 60. Tharu

The other major groups of people include (a) Brahman, Kshatri and Newar whose literacy is relatively better (b) Marwadi, Jha, Mishra and Karna of Terai region whose literacy rate is higher than other groups of the people of that location, and (c) Yadav of Terai (d) Muslim, the religious group. (Source: Ministry of Local Development, 2002)

Appendix 3 Female/Male Ratio by Educational Attainments and Ethnicity\Caste
(6 years and over)

Caste/Ethnic Groups	Literate		SLC & Above		Graduate and Above	
	1991	2001	1991	2001	1991	2001
Upper Caste	54.3	72.5	27.0	46.0	17.6	20.5
Hill Upper Caste	54.3	72.8	27.0	45.9	17.6	19.5
Terai Upper Caste	55.1	69.1	27.0	46.1	17.2	29.9
Terai Middle Caste	27.0	42.4	9.4	20.3	7.1	11.2
Dalits	36.6	57.2	15.2	27.4	15.7	18.6
Hill Dalits	39.1	65.4	16.6	32.3	17.8	19.5
Terai Dalits	21.6	36.1	12.2	18.7	12.3	17.1
Janajatis	48.5	68.9	40.4	50.2	38.1	35.3
Hill Janajatis	52.9	73.1	45.3	56.4	40.0	39.1
<i>Newar\Thakali</i>	65.8	77.9	52.1	61.8	42.2	43.6
<i>Other Hill Janajatis</i>	47.9	71.4	31.2	50.5	30.5	30.6
Terai Janajatis	28.4	53.1	7.8	19.7	4.8	8.3
Religious Minorities	31.8	46.3	13.2	24.8	12.5	22.0
Others	33.6	61.2	22.1	46.6	26.4	32.3
Total	47.4	65.8	28.2	43.6	22.4	22.9

Source: SAHAVAGI, 2004

Appendix 4 Promoting Forces for Girls' and Women's Access to Education

Topographical Settings	Caste/Ethnic Groups	Socio-Cultural Values towards Girls and Women
Mountain	Gurung of Mustang	Hope of the parents to make their daughters independent
	Limbu of Panchthar	Hope of the parents that educated girls get a chance to marry with <i>Lahure</i> (those who go to foreign countries for earning) Hope of the girls to be at par with boys Feeling of the parents that education is more important than the share in parental property to the girls, a provision recently made Science exhibitions in school Homework checking in school Tutorial support by the teachers in STE subjects
	Tamang of Rasuwa	Hope to see the daughter as a school teacher or a staff nurse Feeling that education is the substitute to parental property for daughters Hope that educated girls will not be considered as inferior to boys Parental encouragement that "since we missed an opportunity to be educated, we have to educate our children." Confidence of the girls for study Availability of scholarship support in school Tutorial support in school Presence of educated women as role models for girls
Hill	Rai of Ilam	Parents' exposure to outside districts and abroad Hope of the parents to make their daughters independent Realization of the parents that education ensures social status of the girls Activities of the green clubs in school Encouragement to mothers and teachers
	Brahman of Kaski	Realization of the parents that education ensures social status of the girls Hope to be doctor in life Tutorial support and extra class for girls in school Teachers' encouragement Emulation of the neighbors and relatives Girls' high expectations from education Hope of the parents to make their daughters independent before marriage Boys and their guardians feel more inclined to marry only educated girls.

Topographical Settings	Caste/Ethnic Groups	Socio-Cultural Values towards Girls and Women
	Kshatri of Doti	<p>Kshatri of the neighbors and relatives</p> <p>Presence of role model women in the community</p> <p>Tuition support in the school</p> <p>Raised parental interest in girls' education</p> <p>Recognition of educated girls' parents in the community</p> <p>Extra curricular activities in school</p> <p>Presence of elder siblings and parents to teach girls at home</p> <p>Collegial support and pressure for girls' education</p> <p>Presence of gender sensitive teachers in school</p> <p>Availability of scholarship support for girls</p>
	Magar of Palpa	<p>Parental interest to make their daughters independent</p> <p>Teachers' encouragement</p> <p>Science exhibitions in school</p> <p>Encouraging results of the girls in school</p>
Kath valley	Newar of Kathmandu valley	<p>Realization of the girls that STE is important for modern world</p> <p>Parents' exposures and education</p> <p>Teachers' efforts to involve girls in discussion</p> <p>Exhibitions about science and environment education</p> <p>Hope of the girls to be a career person as staff nurse</p> <p>Presence of educated women as models for girls' education</p>
Plain	Muslim of Banke	<p>Parental interest to make their daughters independent</p> <p>Availability of tutorial support in school</p> <p>Parents' interest to make girls as career person such as nurse, doctor, and engineer</p> <p>Exhibitions about science and environment education</p> <p>Encouragement by Math teachers</p> <p>Award for best performing girls in school</p> <p>Interest of the girls to be educated first and then think of marriage</p> <p>Presence of elder siblings and parents at home to provide academic help</p> <p>Hope of the parents and girls that if they are education, they will get jobs.</p>
	Tharu of Kailali	<p>Raised interest of the parents to educate girls</p> <p>Girls' exposure to STE through visits</p> <p>Teachers' encouragement and regular feedback</p> <p>Science exhibition in school</p> <p>Availability of library in school</p>

Topographical Settings	Caste/Ethnic Groups	Socio-Cultural Values towards Girls and Women
	Yadav of Siraha	Parents' realization that educated daughters will get better husbands Availability of tutorial support in school Presence of elder siblings to teach STE subjects Institutionalized science quiz competition in school Science lab facility in school Teachers' encouragement and regular feedback Science exhibition in school Hope of the girls to be STE teachers Relevance with lived experience of the girls Raised expectations of the girls to be career persons such as engineer and nurse Parents' recognition of the need to educate their daughters Training by Save the Children to young girls in science and technology

Appendix 5 Hindering Force for Girls' Access to and Participation in STE

Topographical Settings	Caste/Ethnic Groups	Hindering Forces
Mountain	Gurung of Mustang	Theory based STE teaching and practice based girl's approach to learning Heavy involvement of girls in tourism business Weak base of the girls and hence more failures Parent's interest for early marriage of their daughters Irresponsible teachers in teaching students Teasing environment in school Docility of the girls to ask questions, argue with teachers and present logics in the class Ego conflict between boys and girls for reciprocal learning
	Tamang of Rasuwa	Gap between girls' practical ways of learning and teachers' theoretical ways of teaching Heavy domestic workload Weak base and frequent failures Parents' differential treatment towards boys and girls Lack of tutorial support Lack of STE teachers
Hill	Brahman of Kaski	Monotonous teaching approach in STE subjects Parent's interest for early marriage of their daughters Absence of role model girls and women in the village Teachers' dominating nature
	Kshatri of Doti	Domestic workload Lack of tutorial support when required Elopement and early marriage system Girls' experience of STE as difficult subjects Doubt about schooled girls' chastity Social values that girls are dependent upon their husband after marriage Regular absence of girls for 10 days in schools because of the monthly period Early marriage, elopement and forced marriage Lack of tuition support Parents' warning to the teachers that their daughters should be passed at all costs.
	Limbu of Panchthar	Submissive nature of girls to ask parents for STE subjects Parent's interest in early marriage of their daughters Girls' interest in social sciences rather than in STE subjects Girls' inhibition to ask questions with teachers Parents' differential treatment towards boys and girls Parents' feeling that investment on girls' education is just like "volunteer labor contribution" Girls' interest to marry/elope with <i>Lahure</i> Heavy domestic work Boys' domineering nature in classroom settings Girls feel ashamed of doing practical work in Science

Topographical Settings	Caste/Ethnic Groups	Hindering Forces
	Rai of Ilam	<p>Culture that demands girls' involvement outside school</p> <p>Heavy domestic workload as a result of which there is no time for STE</p> <p>Lack of tuition support</p> <p>Girls' experience of STE as difficult subjects</p> <p>Weak base in STE subjects</p> <p>Socio-cultural ceiling against girls</p> <p>Lack of practical classes in STE subjects</p> <p>Teachers' inability to teach STE subjects</p> <p>Lack of practice based project work in STE subjects</p>
	Magar of Palpa	<p>Girls' experience of STE as difficult subjects</p> <p>Financial constraints</p> <p>Lack of appropriate reading materials to support STE subjects</p>
Kath valley	Newar of Kathmandu valley	<p>Boys' superiority complex in helping girls learn STE subjects</p> <p>Girls' experience of STE as difficult subjects</p> <p>Lack of parents' guide for the selection of STE subjects</p> <p>Parents' differential treatment towards boys and girls</p> <p>Pro-boy attitude of both male and female teachers</p> <p>Inhibition of girls to ask question about culturally sensitive matters like reproductive health which is further aggravated by boys' harassment during question-answer sessions in school</p> <p>Schools' policy to promote girls even if they have weak base</p> <p>Lack of appropriate reading materials to support STE learning</p> <p>Mother as girls' role model to be worth-emulating</p>
Plain	Muslim of Banke	<p>Lack of interactions in STE subjects with teachers</p> <p>Lack of tutorial support</p> <p>Social thinking that STE belongs to the boys' domain.</p> <p>Parents' fear that girls receiving STE may go against Muslim faith</p> <p>Girls' experience of STE as difficult subjects.</p> <p>Lack of practical activities in STE subjects</p> <p>Early marriage</p> <p>Lack of appropriate reading materials</p>
	Tharu of Kailali	<p>Inadequate time for the preparation of STE subjects for the girls who are already exhausted by the domestic workload</p> <p>Teachers' less attention towards girl-students</p> <p>Inadequate equipment, materials and books in lab and library</p> <p>It is ironic that girl-students require class notes but teachers do not provide them.</p>

Topographical Settings	Caste/Ethnic Groups	Hindering Forces
	Yadav of Siraha	Parental attitude that they should not invest more on girls' education Heavy domestic workload Social values that lay stress on girls' early marriage Value of girls' certificate for their marriage than their quality Celebration of many festivals that demand girls in home Inadequate equipment in STE labs Early marriage and hesitation of girls for further study Teaching technique that has no link no between the girls' practical experience and teachers' theoretical lecture Lack of tuition support Culturally embedded inhibition of girls to ask questions about STE subjects Teachers' pro-boy attitude

Appendix 6 a

Level and Subjectwise Analysis of the Primary Level Curriculum

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
1. Primary Education Curriculum-2060	<p>General objectives: Develop inherent talents of the 'children' (<i>Bal Balika</i>) in different issues and subjects, e.g. nationality, morality, Mathematics and Science, etc: Gender responsive</p> <p>Objective: 5, aims at developing respect to all kinds of religion, caste, culture and ethnicity and it also makes children feel and realize "gender equity": Balanced perspective on gender, class, caste, ethnicity and religion</p>	<p>Introductory chapter mentions: "still in this 21st century, discriminations based on gender and caste prevails in the rural areas of Nepal," whereas urban areas also are not free from discriminations.</p> <p>The contents of each subject are elaborated <i>neutrally</i> by using the term <i>students</i> in some places and <i>Bal Balika</i> (in Nepali) in other places</p>	<p>Instructional Strategies seem flexible, much supportive and facilitating to children. However, it does not consider the differential position of girls and boys in the family and in larger society. Girls' access to and control over education is limited due to various socio-cultural and economic factors</p>	<p>The format/ file of Continuous Evaluation Process has no sex-disaggregated recording system (Annex 2, primary curriculum). Such averaging process does not point out in which subject girls or boys are really poor and need some extra efforts and attention.</p>	
1. Mathematics	<p>The objective is to enable '<i>students</i>' in basic counting, calculations and drawings: Gender neutral</p>	<p>The contents are elaborated gender-neutrally.</p>	Gender neutral	Gender neutral	<p>According to Sinha (2001, Pg. 74), basic learning competency of girls in Mathematics is lower than that of boys. Thus, neutral treatment of girls and boys in the curriculum and instructional strategies does not bring gender equity in mathematical performances.</p>

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
2. Science & Environment Education	The objective is to impart basic knowledge in science and technology to the 'students' vis-à-vis the changed time and context: Gender neutral statement	As in Mathematics, keeping "students" at the center of analysis, Science curriculum also treats both girls and boys neutrally.	Although there is introduction of multiple instructional strategies, there is no scope for mutual learning between girls and boys.	Gender neutral	In practice, generally boys get more opportunities to learn/practice Science at home, whereas girls are more familiar with the surroundings because, since early childhood they are socialized to keep the household and its surrounding clean. In the curriculum, there is no space for sharing each others' experiences or mutual learning.
3. Health and Physical Education	As in other subjects, the objective is gender neutral	Contents are gender neutral			The neutral explanation of health and physical education neglects differential health and nutritional needs of men/boys and women/girls with differential impact on them. Similarly, the need of physical education is also not equally felt by both sexes in our society. Since early childhood, boys and men are preferred and encouraged to play or go outside and maintain their physical and mental balance, whereas girls are found mostly domesticated to household duties. Thus it perpetuates patriarchal value system and socializes them accordingly.
II. Lower- Secondary Level	The main aim is "to prepare a patriotic <i>citizen</i> who is not only sensitive to the nation and democracy but also ...". Using the neutral terms ' <i>citizen</i> ' and ' <i>pupils</i> ', a lot of qualities have been expected from lower secondary graduates without giving attention to gender sensitivity.				

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
1. Mathematics	The main objective is to enhance the mathematical knowledge and skill of the 'students' in five main areas of Mathematics: Gender neutral	The contents are neutral. The term "students" has been used everywhere.	Various gender neutral methods are used assuming that girl students are as capable and competent as boys.	Regular evaluation (40%) and final examination (60%) process are adopted to evaluate mathematical performances of students.	Such evaluation process mainly benefits those girl and boy students, who are regular in class. So, special efforts should be made or even effective mechanism devised to ensure regularity of students (especially girls) at school.
2. Science Education	The objective is to increase knowledge of children in science and technology and develop their analytical skills: gender neutral	The contents are all gender neutral in science education	Instructional strategy says that 'if students become unable to acquire knowledge as per the objectives, their problems should be addressed by the teachers by using appropriate teaching- learning methods (Pg. 25).		Girls and boys may not have the same understanding or problems in Science. Girls may possess more indigenous knowledge and experiences and boys may possess more theoretical knowledge and techniques. Thus, neutral treatment of boys and girls and neutral explanation of instructional strategies in Science may not reflect the social reality and ignore the opportunity of mutual learning.

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
3. Health and Physical Education	The objective is to develop knowledge, attitude and skills about physical health and mental fitness among the <i>students</i> and try to bring some positive changes in their personal and family health behaviors.	The contents neutrally explain the importance of nutritious food, healthy environment and personal and family health cares. Topics included in Physical Education are also neutral.		The students' performance evaluation form for Physical Education has separate columns for girls and boys, which is very much necessary for gender equity perspectives.	The contents assume equal access to household resources (calorie food, health care, etc) among the family members (girls/women and boys/men). Besides, need of Physical Education is not equally felt by both sexes. Generally girls are not encouraged or allowed to play or do physical exercises at home, which could hamper their physical and mental growth. Thus, neutral explanation of Health and Physical Education in the curriculum perpetuates gender stereotypes and patriarchal value system to the girl and boy students.
4. Population and Environment Education	To develop <i>students'</i> knowledge, attitude and skills about population and environment with effective management. One general and specific objective (for each grade) has been separated for adolescence, reproductive health and sex education but there is no gender specific component.	Contents are elaborated neutrally separating one unit in each grade for adolescence change, reproductive health and sex education. Women and gender are included in very few cases, for example, female/male sex organs (Pg. 11, 20), responsibilities of adult girls and boys (Pg. 29) and gender equity and sexual harassment. (Pg. 29).	Although instructional strategies are unit-wise and grade-wise, they are all gender neutral.	Gender neutral	<ol style="list-style-type: none"> 1. Neutral explanation of adolescence changes, reproductive health and sex education will not address differential adolescence problems and needs of girls and boys. 2. 'Gender equity' is not just a term to be included under a sub-heading of a sub-unit of a unit. 3. Instead of including a unit or a topic related to women and gender, all the issues of population, health and environment should be analyzed from a gender perspective.

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
III. Secondary Level	The main objective is to prepare an ideal <i>citizen</i> who is well known to national culture and tradition, is sensitive to democracy and hardworking, has scientific outlook, and so on. Thus, a lot of qualities are expected from secondary level graduates, without realizing the need of having gender sensitivity.				
1. Mathematics	The objective is to develop livelihood oriented mathematical-knowledge and skill among the <i>students</i> and enable them to enjoy Mathematics.	Generally the contents are gender neutral and there is use of gender-neutral words, e.g., students, teachers, humans, etc. However, in a few cases, gender sensitive words have been used, e.g., male and female students (Pg. 31, 32 of Grade: 9).	Instructional strategies, although developed properly, are gender neutral	Evaluation methods: gender-neutral	1. Although gender responsive words have been used in a few places in the Mathematics curriculum, it is basically gender neutral. 2. No specific measures have been suggested to enhance the mathematical performance of girls and other targeted groups.
2. Science Education	The objective is to provide knowledge and skill in scientific laws and principles, natural phenomenon and their effect in human life to the <i>students</i> : gender neutral	Although contents are gender neutral, all male scientists' theories and principles are mentioned in the contents (e.g., Newton, Pascal, Mendal, Oham), which naturally inspire boys more than girls.	There are no instructional strategies in Science curriculum	No evaluation mechanism too	Although female scientists are few even at present, the curriculum writers have given no recognition to them.

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
3. Health, Population and Environment	1. The main objective is to enable <i>students</i> to understand the concepts, situation and problems of health, population and environment and identify ways to manage the problems practically. 2. Although one of the specific objectives in each grade is to introduce the concept of <i>Adolescence, Reproductive Health</i> (Grade: 9) and <i>Safe Motherhood</i> (Grade: 10), the objectives are mainly gender neutral. However, one of the units in grade 10 has the topic titled 'Family Life Education' (Pg. 9), which is gender responsive and sensitive too.	Contents are similar to lower-secondary level with some additions and improvements according to the level. Unit 1 of grade 10 (Pg. 16) has some topics related to father's and mother's responsibilities towards children, old age, family planning, marriageable age of girls and boys with the advantages and disadvantages of early and timely marriage, which are gender sensitive. Similarly, the Units of Adolescence, Sex and Reproductive Health Education of grade 9 and Safe Motherhood of Grade: 10 are also gender responsive.	Instructional strategy is <i>student centered</i> and is gender neutral.	Evaluation method is participatory and gender responsive. The marks allocated to theoretical and practical examinations (75 and 25 marks each) are likely to less pressurize children, but the question arises about the regularity of girls and getting benefit from this process.	1. Concepts of reproductive system, reproductive health and reproductive rights, adolescence and changes occurring with it and sex education are much relevant to the secondary level age groups. 2. Knowledge about safe motherhood, and anti-natal and post-natal cares should be provided in such a way that both girls and boys of this age groups can support or inform other family and community members about these services. 3. Besides, other topics, e.g., characteristics of population (birth rate, child mortality, life expectancy, etc), causes and effects of population changes, family life education, family planning and community health, should be analyzed from a gender perspective with gender disaggregated statistics and interpretation.
4. Optional Computer Science	To impart <i>students</i> basic knowledge about computer system and use it as a means of modern communication.	Keeping students at the center of analysis, the contents treat gender neutrally both girls and boys.	Gender neutral but there is scope of mutual learning among one another.	Evaluation process is participatory but gender neutral.	Some topics, e.g. Impact of Computer on Society, Cyber Law and Ethics, Entering and Editing Data, etc should have gender sensitive analysis and interpretation.
IV. Higher Secondary Level	The main objective is to produce medium level ' <i>human resources</i> ' providing educational opportunities to the <i>sons and daughters</i> of those people also, who are living in far-remote areas of the country.				

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
1. Mathematics	The general objective is to enable <i>students</i> to acquire basic knowledge in Mathematics by creating an aptitude for Mathematics and developing their skills in applying it. Statements are gender neutral.	There are detailed course outlines in the curriculum, which are gender neutral.		No evaluation mechanisms given in the curriculums	Although contents are gender neutral, all male-written textbooks and reference books are prescribed in the curriculum. Science and Mathematics are still taken as men's subjects worldwide. But women are breaking this notion gradually. Women writers are, however, rarely found, especially in Mathematics.
2. Physics, Chemistry and Biology	Generally, objectives are gender neutral and there are uses of gender neutral words, e.g., <i>students</i> , <i>person</i> , etc., but in Biology in one place there is the mention of the pronoun "He".	In the contents of each subject, the neutral-terms <i>students</i> and <i>teachers</i> are used and elaborated neutrally.	In Science, there are experimental classes with some guidelines for curriculum transaction in Physics, but they are gender neutral.		Use of the pronoun 'He' only once in the objectives of Biology may not be a big matter, but this is a reflection of our deep-rooted ideology, which still perpetuates centrality of men in science and technology.
3. Population Education	The general objectives are gender neutral, while some are vague. For example, the objective " <i>to develop desirable behavior and attitudes towards population issues and to take a rational decision about desired family size</i> " is quite vague. There are several specific objectives and one of them is <i>status of women and children in Nepal</i> .		Out of 150 teaching hours, Mathematics occupies 32 hours but there is no mention of instructional strategies either in theory portion or in Mathematics.	No mention	1. The desired family size as prescribed by the government is " <i>two children</i> " with two months maternity leave (somewhere two weeks paternity leave for father, e. g., in T. U.) without any provision (or very limited) of secure child life. 2. As women occupy half the entire population of Nepal, any policy, plans and perspectives related to population should be very much specific to men and women. Any generalized conclusion can affect the status of women and children in Nepal adversely.

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
4. Health and Physical Education	The objective is to enable <i>students, especially the young people</i> , to know about their body functions, concept of family health, major health problems and community health services of Nepal. Objective is gender neutral	The contents are focused on family health, health policy and programs, health education, etc. There are many inclusions of women's issues including the concept of <i>responsible parenthood</i> . In Physical Education, there are only male centered playing items mentioned in the contents, e.g., Basketball, Football, Volleyball, Kabaddi, etc.	No mention	No mention	From a gender perspective, health education cannot be generalized in the family health. <i>Within family, health and nutritional needs, health problems and access to health services for men, women and children are different.</i> Thus the objective should be gender specific. For health education, the inclusion of gender or women's issues only is not sufficient. There should be a gender perspective in each and every health issue, e.g., policy, programs, prospects and problems. Then only can the desired goal of gender equity in access to and control over quality health services be achieved. This does not mean that women cannot play these games, but the curriculum should highlight the importance of physical education and daily exercises to both girls/women and boys/men.

Levels/ Subjects	Objectives	Contents	Instructional Strategies	Evaluation Mechanism	Remarks
5. Computer Science	In both grades XI and XII, the main objective is to develop internationally competent <i>manpower</i> in the field of Information and Technology and meet the demand of medium level technical <i>manpower</i> requirement. But the specific objectives use neutral word <i>students</i> .	Keeping students at the center of analysis, the course contents neutrally impart theoretical and practical knowledge and skill of Computer Science. The Unit “Computer and Society” of grade XII (Pg. 113) and Impact of Computer in Society and Ethical Aspects are gender neutral.	Although there is necessary information about Computer Room Environment but these are gender neutral. As mentioned in the curriculum, “ <i>Teacher’s guidelines and instructions will have to be developed</i> ”.	Evaluation methods, although given in grade XII curriculum, are gender neutral.	<ol style="list-style-type: none"> 1. Use of the word <i>manpower</i> in the objectives promotes centrality of men or male biases in the curriculum. 2. Generally boys/men have more access to and control over information and technology and since the subject is elective, girls may not want to choose this subject. So special attention should be given to encourage girls, especially in school/classroom environments. 3. Impact of computer is both positive and negative so computer education should facilitate girls and boys to analyze its impact in a gender sensitive way. The ethical aspect should be justified from a human rights perspective.

Primary Level (Grade 4 and 5)**1. My Environment****Positive Aspects:**

- Front page of grade 4 is child friendly; both girls and boys are flying kites.
- Improved Textbooks: As said in the introductory chapters of both grades (4 and 5), the books are prepared and revised after extensive discussions and consultations with *teachers, guardians and resources persons*. Furthermore, the achievements made by girls and boys during last two or three years were also taken into consideration.
- Two (33%) of the six-member textbook preparation team of grade 4 are women.
- The textbooks of both grades 4 and 5 aim, it has been said, to avoid disparities based on geographical region, caste, ethnicity, disability and gender.
- The contents of both grades are addressed to both girls and boys.
- The first Unit of grade 5 shows (in picture) both girls and boys playing, which is extremely necessary for healthy development of children.
- In the main texts (with pictures), both father and mother are sharing information or knowledge with their daughters (Pg. 23, 27, 66 in grade 4; Pg. 87-93 in grade 5) and sons (Pg. 40). Thus, it has broken the myth that only men are the source of information or knowledge, showing that they can share information with their children.
- Father and mother are taking their daughter and son to a health post (Grade 4, Pg. 63, 73) but the doctor and health workers are men (Grade 4, Pg. 63, 73 and 108).
- Women, men and girls are in productive work (Grade 4, Pg. 128; grade 5 Pg. 72 and 73)
- Children are supporting men and women in their community work (Grade: 5, Pg. 100, 119).

Things to be reformed

- Only women are shown in water sources (Grade 4, Pg. 97, 98; grade 5, Pg. 80).
- Only boys are pictured in such activities as playing, cleaning, washing, eating, taking rest, doing exercises, even living in dirty surroundings or in malnutrition (Grade 4, Pg. 65, 74, 76, 85, 103, 109, 128; grade 5, Pg. 35, 69, 101, 113). This means our daily life activities are expressed mainly through boy child. Very few activities like combing hair (Grade 4, Pg. 105 and 106) and washing clothes are shown through girl child. Thus, the pictures are mainly presenting androcentric biases and no effort has not made to change the stereotypical gender roles or images of girls and women.
- The front page of grade 5 is stereotypical. For example:
 - A woman and a girl are carrying water pots (although the girl is carrying a small one),
 - A woman is carrying a baby on her back,
 - A woman is taking care of goats,
 - A boy is brushing his teeth.

- Use of the gender neutral word *Shykshyak* (or teacher) throughout the textbooks (in grade 4 and 5) fails to reflect the presence of any female teachers.
- In grade 5, only one out of the seven-member (14%) curriculum preparation team was woman.
- Different stages of life are shown only through boys (Grade 9, Pg. 9).
- Women are shown with brooms even in water source (Grade 5, Pg. 43).
- In a topic relating to natural resources, two boys are shown holding conversation about water resource management. The text mentions that the women and children who were there to collect water, upon listening to their conversation, get surprised (Pg. 82). Here the textbook intentionally assigns the task of collecting water to women and children, while efforts have been made to present men as knowledgeable. It apparently ignores women's indigenous knowledge in terms of natural resource management.
- All drivers are men (Grade 5, Pg. 87, 117) in productive works.
- Generally exercises are addressed to boys/men (in grade 5, Pg. 84, 94, 96, 110 and 111).

2. My Mathematics

Positive Aspect:

- Front pages of both grades are gender responsive.
- Improved Textbooks: Revised after an intensive discussion and consultation with teachers, guardians, head teachers and resource persons.
- Women's participation: In grade 4, only one (20%) of the five-member textbook preparation team is woman.
- In both textbooks of grades 4 and 5, it has been written that the books are trying to avoid disparities based on geographical region, caste, ethnicity, disability and gender.
- In the main texts of grade 4, some pictures are representing both girls and boys (pages 77, 78, 97, 103, 145, 152).
- Seating arrangement in the class shown through pictures is gender-balanced, i.e., both boys and girls are seating together (Grade 4, Pg. 161).
- In grade 5, the text, examples and pictures are mainly gender neutral. Both girls and boys are addressed indirectly in gender neutral language.

Things to be reformed

- In grade 4 Mathematics, male and female names occur 154 times in the main text, examples and exercises. Of them, male names occur 117 times (76%), while female names occur 37 (24%) times. It shows that the textbooks have given preferences to male names.
- Similarly in grade 5, female and male names occur 102 times in the textbook. Of this, male names account for 80.4% and the rest are female.
- There are various examples and exercises related to household resources. Analyzing who is associated with what household resources, especially money, it was found:
 - In grade 4, out of the total of 30 examples and exercises associated with money, 28 (93.3 %) are associated with boys/men and only 2 (6.67 %) are associated with

girls/women. For example, “Shiva’s father spent Rs. 12,501 in children’s education, Rs. 22,691 in food ... How much did he spend in one year?”

- Similarly, in grade 5, of the 18 examples associated with money, 17 (94.4%) are associated with boys/men and only 1 (5.6%) is associated with girls/women.

Thus, these examples and exercises perpetuate the patriarchic control over money and money related matters. It means men are the bread winner and women merely depend on them.

- In addition to the money-examples, male names are mainly associated with fruits, milk and important consumables, whereas female names are mainly associated with ribbons and bread (Grade 5, Pg. 32, 62). Male preferences in food distribution or priority given to men during calorie food in-take have prevailed in our society since early times. And this concept has been symbolically represented in the textbooks, associating boys with fruits and girls with bread. But it is necessary for the textbooks to maintain a balance while analyzing the importance of foods and exercises, and examples should be worked out accordingly.
- Men are directly associated with productive works either through pictures or by placing them in the main text (grade 4, Pg. 26, 32, 45), whereas only one woman is shown in the main text associating her with productive work (Pg. 58), and this, too, is without any picture.
- Although efforts have been made to neutrally address male/female teachers by using the words “teachers and Guru” (Grade 4, Pg. 26, 88, 158, 173) in the texts, they do not reflect female images as teacher.
- Although there are few pictures in the textbook of grade 4 (Pg. 34), only one group of boys are playing volleyball. This is indicative of the fact that the outside field belongs to men.

Lower Secondary Level

1. Population and Environment Education

Positive Aspect:

- Front page (pictures): Males and females of different castes and ethnicity have been presented.
- In all front pages of grades 6, 7 and 8 and pages 51, 54, 60, 62, 63 of grade 6, pages 57, 78, 79, 82, 85, 90, 91, 96 of grade 7 and pages 4, 5, 78 of grade 8, both boys and men, and girls and women are shown participating in community works.
- Gender responsive words have been used everywhere in the textbook such as boys and girls, old men and women, father and mother, grandfather and grandmother, grand son-grand daughter, etc.
- In activity 3, children are asked to visit seven houses and list the total number of population with males and females separately.
- Picture of the city life with the presence of male, female and children (Pg. 12)
- A woman has been shown as one of the chief guests at a school function (61).

- Women’s education and employment are given importance in the management of population.
- Activity 10 (Pg. 48) aims to collect information about the marriage age of girls and boys in 10 to 12 houses and also traces the reasons for late and early marriages of children.
- Rural and urban distribution of population in grade 7 has sex-disaggregated information. It will also show the situation of internal migration of the country.
- In the separate topic of “Male and Female in Nepalese Population”, distribution of population in different decades (B.S. 2028-2058) has been given (Grade 7).
- In an activity (Grade 7, Pg. 35), children are asked to observe and write the costumes or dresses of male and female in their locality.
- In the case of grade 8, both boys/men and girls/women are involved in community works (Front Page).
- Both males and females have taken part in a public awareness program (Grade 8, Pg. 74, 79) but the number of women and men is not equal.

Things to be reformed

- In grades 6 and 7, a team of only 14-15, all of them men, are involved in the preparation of the textbook. Only in grade 8, one of the 15-member team (around 7%) is woman.
- Effect of increased population in the food habits, clothing, health and employment opportunities of women and men should be specifically addressed.
- Activity 1 (Grade 6, Pg. 3) has asked to find the number and work pattern of the people in four houses without specifying the male and female number and their division of work. But it is very necessary to make the children aware of the distinctions of work at homes.
- Concept of family with love, harmony, co-operation, etc. without analyzing the family members’ work and their role and sacrifice in maintaining family harmony and peace.
- Concept of “ideal” family with two children (Grade 6, Pg. 9) as specified by the government and not by the parents or couple
- A joint family in a picture has 10 male members and only 3 female members. All men in the picture are wearing shoes or sandals, whereas women are shown bare-footed (Grade 6, Pg. 9). This shows how poor the women are.
- In every water tap, there are only women and girls (Grade 6, Pg. 16, 38, 63) and a woman is seen collecting firewood (Grade 8, Pg. 48).
- Concept of male head of the household in an exercise (Grade 6, Pg. 21) where it has asked to write the number of family members of the grandfather’s family and father’s family
- Mostly men are shown involved in productive works (Grade 6, front page and pages 17, 26, 34, 35, 46, 55, 56, 59, 60; grade 7, pages 68, 75, 81; and grade 8, Pg. 8, 40, 72). In few cases, women are pictured being involved in productive (mainly in small businesses, construction works and non-formal education teachings) works (Grade 6, Pg. 17, 46, 47, 55; grade 7, front page and pages 14, 47, 75, 86, 73; and grade 8, Pg. 8 and 40).
- Although women are shown visiting health posts, the doctor or health worker happens to be a male (Grade: 6, Pg. 34, 59 and Grade 8, Pg. 59, 71).
- Although both girls and boys are shown supporting community works, girls are represented far less than boys.

- Right to education and employment are women's human rights so this should not be limited to only managing population, limiting childbirth, childcare, child health and children's education.
- It is mentioned in the text that "as women are always busy in household works, they should be rescued from these types of works through skill development and small income generating activities. When they get involved in economic activities, they do not want to bear many children." (Grade 6, Pg. 47, 48; grade 7, Pg. 73; and grade: 8, Pg. 40). The assumptions behind this are:
 - Women are mainly responsible for increasing population so they should be targeted to control or manage population: views of 1960s
 - Mothering and child caring is women's major responsibility: Welfare approach (Pre-WID) of 1960s
 - Women's condition will be improved through their integration into household-oriented small income-generating activities. This will also help in the reduction or management of the population growth rate: views of 1970s.
- Similarly the issues are:
 - Are women independent to make choices between their schooling and marriage?
 - Are women free to make decisions on whether to bear a child or not?
 - Are women free to decide about the number and sex of children?
 - Why are women facing the problems of unwanted pregnancy and unsafe abortion?
 - What is the role of men in population management?
 - What will be the role of men in houses when women begin income-generating activities outside of the home?
- There should be sex-disaggregated data of population distribution such as total birth, death, migration, employment, etc. Then only do the school-going children know the country's human development situation.
- Besides the total population in different decades, other elements of population such as birth rate, death rate, migration rate, economically active and dependent population are not separated in a sex-disaggregated manner.
- In an exercise (Grade 7, Pg. 37) also, different age groups of population have been presented through a bar diagram without sex-disaggregation.
- A picture of dependent population has been shown through an old man and a boy child illustrating that only males are a dependent population (Grade 7, Pg. 22).
- Drivers including a scooter driver are all male (Grade 7, Pg. 47; grade 8, Front Page, Pg. 47, 49, 52, 58).
- Educational statistics (e.g., literacy, enrolments and number of teachers) is also not given in a sex-disaggregated way, which only generalizes the reality. But the term "school going girls and boys" has been used and the average figures are given (Grade 8, Pg. 62).
- Food serving is done by females only (Grades 7 and 8) and reproductive work is the women's domain.
- On the school premises, boys are only shown as playing football (Grade 8, Pg. 71). But the message to be conveyed should be, playing is equally necessary for both girls and boys.

- In almost all health matters, boys or men are shown in malnutrition or undergoing health check-ups or lacking health facilities and their impact (Grade 6, Pg. 34 and grade 8, Pg. 45, 59, 71, 72).

In some places of grades 6, 7 and 8, few gender neutral words such as *Balak, Yubak, Thula Manchhe and Shikshyak* in Nepali have been used, perpetuating the androcentric biases in the textbook.

2. Health and Physical Education

Positive Aspect:

- Front page of grade 7 represents both boys and girls equally while doing physical exercises.
- Use of gender-disaggregated words, e.g., *keta-keti, bal-balika, guru-ama* (in Nepali), father and mother and men and women (Grade 6, Pg. 24-27, 31, 44; grade 7, pg. 13, 18, 43, 50-61, 64, 66; and grade 8, Pg. 17-19, 32, 38, 61)
- The topic Family Health has a gender balanced picture where both father and mother are bathing their small child. This gives the message that childcare is not an exclusive duty of woman only. The text also conveys the message that child rearing and caring of sick people is a common responsibility of all the family members (Grade 6, Pg. 50).
- Nutritional needs of children, pregnant women and lactating mother are treated separately in the topic Nutrition (Grade 7, Pg. 13, 18, 19)
- The topic 'Family Health' of grade 7 has highlighted the importance of ANC and PNC cares including safe motherhood (Pg. 58 and 60) for healthy child and healthy mother.
- In Physical Education of grades 6, 7 and 8, both boys and girls are shown doing exercises, playing games and practicing athletics.

Things to be reformed

- Front pages of grades 6 and 8 are biased. They show only men doing physical exercises and brushing teeth, whereas personal hygiene is equally important for both girls and boys
- Altogether 15-16 members are involved in the textbooks preparation teams of grades 6-8 and only two of them (12.5%) are women in the team of grade 8. Other teams have no women at all.
- In the introductory parts of all grades and in the main texts also, neutral terms like '*teachers, students, guardians, educational experts and patients* (Pg. 25-27)' have been used, which indirectly perpetuates the centrality of men or boys. Examples abound in the text of grade 6:
 - A boy is brushing his teeth (Pg. 11)
 - A boy and a man are taking bath (16 and 17).
 - A sick man is lying in the bed (Pg. 17).
 - Women are cooking, washing and collecting water (Pg. 16 and 17), portraying stereotypical gender division of work.

- The topic titled Personal Hygiene has suggested some ideas for personal hygiene. One of them is “girls should comb and bind their hair properly” (Grade 6, Pg. 44). This typically portrays the stereotypical role of the girls and women.
- Similarly, smoking and drug addiction not only affect the users (Grade 6, Pg. 47) but also other family members, especially wives of the addicts.
- Man in productive work (Grade 7, Pg. 25) is presented as usual.
- Most of the pictures in the textbooks are male centered showing them either sick or healthy or malnourished (Grade 7, Pg. 29, 30, 32, 35 and grade 8, Pg. 18, 24, 29, 57). The only exception is of a polio-affected girl (Grade 7, Pg. 33). Thus, the textbook seems to have made an attempt through the picture to depict the social reality that our society gives more priority to sons than to daughters and they are more likely to get health care immediately. The impact of smoking and drinking alcohol on women and children is also lacking.
- Separate explanations have been made in the contents related to:
 - Male and female organs (Grade 8, Pg. 2-12, 60),
 - Symptoms of some disease seen in boys/men and girls/women and (Grade 8, Pg. 32-39, 45, 46)
 - How certain diseases affect men and women,
- Although gender-disaggregated words have been used especially to show the impact of food deficiency, diseases, pollution, etc. neutrally on women/ girls and men/boys in Health and Physical Education of all grades, the term person, *human and the pronoun ‘He’* (*uoo* in Nepali) have been used. Such inclusion of gender responsive words in the contents and exercises make the textbook gender aware but not gender sensitive.
- Similarly, impact of malnutrition is severer on girls and women than on boys/men due to less preference given to the former’s health care and nutrition even by the women themselves.
- In Physical Education of grades 6, 7 and 8, boys are shown frequently playing and doing physical exercises through pictures. For example:
 - In grade 6, there are 52 pictures where boys are shown 36 (51.9 %) times, girls are shown 10 (19.2 %) times and in the rest (28.9 %) both are shown.
 - In grade 7, there are 52 items shown through pictures. Of this, pictures depicting boys account for 51.9% (27), pictures depicting girls 19.2% (10) and the pictures depicting both boys and girls 28.9% (15).
 - Similarly, in grade 8, there are 59 items shown through pictures where boys are shown 37 (62.7%) times, girls 15 (25.4%) times and both boys and girls 7 (11.9%) times.
 - Basically in all grades (6, 7 and 8) boys are doing yoga, playing high jump, long jump, football, *kabaddi* and volleyball, throwing ball and doing other physical exercises, whereas girls are shown playing volleyball, *kabaddi*, throwing ball, practicing athletics and doing other physical exercises.
- The above mentioned scenario should be improved by presenting both boys and girls equally in terms of playing or doing things. As all games contribute to the development of mental and physical faculties of children, they should be presented equally as best as it can be.

3. My Mathematics

Positive Aspect

- In grade 8, five out of the 16-member textbook preparation and development team are women, that, is 31%.
- Female names are also associated with money (Grade 6, Pg. 108, 109, 119; grade 7, Pg. 60, 72; and grade 8 Pg. 38, 40, 47) and fruits (Pg. 102, 104, 105,) in few cases.
- In some examples and exercises, population figure is given in a sex-disaggregated way (grade 6, Pg. 106).
- In an exercise (Grade 6, Pg. 127), a girl riding a bicycle has been mentioned which is, in fact, very common these days. But such illustrations are not still found in the textbooks. This is the symbol of women stepping out of their private quarters onto the larger world. This particular exercise also shows women's mobility and is, therefore, gender empowering. Similarly, in an example of grade 8 (Pg. 97), a girl Anjali is doing physical exercise early in the morning, which is likely to inspire girls and women for physical development.
- Unit 7 of grade 7 is more gender sensitive, as:
 - It has gender-disaggregated statistics (Bar Graph) about the number of students in different classes (Pg. 94).
 - The exercises also have some gender-disaggregated statistics (Pg. 95).

Things to be reformed

- The 19-member textbook preparation and development team of grade 6 has no women at all. In grade 7, there is 1 (7%) woman out of 14 members and this seems nothing more than a formality.
- In grades 6, 7 and 8, though there are a few uses of gender responsive words like girls and boys (Grade 7, Pg. 25, 26, 100 and grade 8, Pg. 37) in the contents and exercises, male names (e.g., Ram, Krishna, Shiva, Prem, ect.) are more frequently mentioned than the female names like Laxmi, Sunita, Rabina, etc., as in the primary level Mathematics.
- Use of many gender neutral words, e.g., teacher, *Guru*, students, business people, shop-keeper, wage labor, etc. perpetuates only male biases. For example:
 - All the above-mentioned neutral words are associated with male verbs in Nepali (Grade 6, Pg. 11, 16, 58, 109, 112, 117; grade 7, Pg. 78, 79, 81; and grade 8, Pg. 40, 41, 42, 48, 56).
 - In pictures (Grade 6, Pg. 20; grade 7, Pg. 33, 47; and grade 8, Pg. 3, 13) class teachers and students are all male.
- In the primary level textbooks, male names are mainly associated with money (Grade 6, Pg. 81, 98, 99, 103, 107-113, 147; grade 7, Pg. 60, 72, 76, 78, 79, 81, 82 and grade 8, Pg. 36, 42, 47, 56) and calorie foods (Grade 6 Pg. 73, 130; grade: 7, Pg. 60), whereas female names are associated mainly with bread (Pg. 66, Grade: 7, Pg. 60), ribbons, etc.
- Even the illustrations where women are associated with money are typically portrayed as spending money or depositing it at the bank. They are not shown as income-making women. Such illustrations do not take women as an economically independent being and are, thus, contributing to perpetuate the traditional image shaped by patriarchy.

- Similarly, women are shown buying small items (comparatively less valued) such as eggs and vegetables (Grade 8, Pg. 38, 40), while men are shown as buying or selling both small and big items (comparatively with high value) like radios, fruits, stationary, TVs, and cars (Grade 8, Pg. 40, 41, 42, 47). It amply shows that men have a greater say in making HH decisions.
- Productive works are always limited to men only (Grade 6, Pg. 20, 107). One exceptional case is that of a woman shopkeeper (Grade 6, Pg. 108)
- Some exercises (Grade 7, Pg. 75) give such examples as- In a school, there are 260 students and 182 of them are boys. Then, how many girls are there?
- Though it is a social reality that boys outnumber girls in many schools but such examples or exercises may give a feeling of superiority to the boys. So, in order to ensure gender equality in enrolment and retentions, the textbooks should disseminate positive messages.
- In reality, tourists visiting Nepal are always both male and female. So they should be represented through sex-disaggregated data (Grade 8, Pg. 36).
- Besides tourists, demographic data such as the number of adult population, workers and their wages, etc, should have gender-disaggregated information.

4. Our Science Book

Positive Aspect:

- Women's participation in textbook preparation and development process is about 13-20 percent in grades 6, 7 and 8 including some foreign experts in grade 8.
- The textbooks of all three grades are more informative and are written in the gender-neutral language, using the pronoun "You" in the main texts, examples and exercises.
- Both male and female names have been mentioned in the exercises of grade 7, Pg. 23 and grade 8, Pg. 13.
- Community work is done by both girls/women and boys/men in grade 7, Pg. 129.
- Both men and women are shown in public places in grade 7, Pg. 129 and grade 8, Pg. 137 and 138.
- In all the three textbooks, pictures have been used doing some kinds of experiment and a very conscious effort has been made not to be biased against any class, caste, ethnicity and gender by using humans only (Grade 6, Pg. 32, 33, 47, 66, 67, 81, 85, 92, 93, 102, 106; grade 7, Pg. 6, 7, 16, 22, 37, 51, 76, 77, 105; and grade 8, Pg. 7, 12, 17, 18, 23, 27, 29 -2, 53, 55, 128).

Things to be reformed

- In activities 5 and 10 of grade 6 (Pg. 6 and 11), there are instructions to form groups of five students each. But nothing is mentioned about their sex composition. And, for gender sensitivity, the number of girls and boys should be mentioned in a sex-disaggregated way.
- There are few pictures in the textbooks of grade 6, 7 and 8. Of them, boys presented separately are more than girls:

- Frequency of pictures with separate representation of boys is 15 (Grade 6, Pg. 21, 28, 35, 37, 174; grade 7, Pg. 2, 19, 20; and grade 8, Pg. 10, 18, 20, 24, 34, 75, 141), and
- Frequency of pictures where girls are presented separately is just 4 (Grade 6, Pg. 18, 19; grade 8, Pg. 53, 55).
- It shows that unless the whole process of providing education is made gender-sensitive, such androcentric biases continue to enter textbooks, directly or indirectly.
- There are some pictures where both male and female are shown together. In grade 6 (Pg. 31), both man and woman, for example, are shown fetching water from two separate wells. From a gender perspective, it may be a good example of sharing HH work together, but there the man is using pulleys, a technology for fetching water (*Ghirni* in Nepali), whereas the woman is using a rope and a bucket. In other words, more manual labor is involved in her work. This is another issue of gender analysis. Whatever the forms of technology are developed or introduced in HH or community such as tractor, grinding mill, *ghirni*, etc, they are controlled by men. Thus, the textbook is also perpetuating the same social or patriarchal reality that control of power, resources and technology lies with the men.
- Similarly, in the first Unit of grade 7 (Pg. 1, 2), both man and woman are shown involved in work but *the man is using a wheel-cart (thelagada) to carry loads, whereas woman is using rope, bucket and her manual labor to fetch water from a well.*
- In Unit 4 of grade 7, there is a picture of a classroom with both girls and boys but the teacher is male (only). This also shows androcentric bias.
- Only theories and principles that are propounded by male scientists are mentioned or recognized in the textbooks, e.g., *Magnas found Loadstone* (Grade 6, Pg. 70).
- In Unit 3 of grade 8, the topic 'Pressure' has a picture of two human legs, one wearing a simple sandal and another with a pointed heel and the text writes: "*How does a person (Manish in Nepali) feel while walking in the farm wearing sandals with and without pointed heel of women*"? Here, women's identity has been directly linked with the pointed heel. It is, therefore, important to analyze how textbooks portray or interpret women's image.

Secondary Level

1. Population and Environment Education

Positive Aspects:

- The front page of grade 9 depicts a small and 'ideal' family with parents and two children, one son and one daughter
- Age and sex-wise distribution of population in the last three decades has been given in a separate chapter and Tables (Grade 9, Table 9 and 7).
- All the contents of grades 9 and 10 have used gender responsive words, e.g., father-mother, *bal-balika*, *son and daughter*, and *yuba- yubati* (in Nepali) except in few cases where the term *Balak* (in Nepali) has been used (Grade 9, Pg. 9; and grade 10, Pg. 13).
- In the first exercise (Pg. 30), children are asked to collect information about the sex-wise population of their locality.
- In the topic, Causes of Population Changes, although the neutral terms "elderly people" (*pako umerka byaktiharuru*) have been used in the text (Grade 9, Pg. 70), the terms "male and female elderly people" (Grade 9, Pg. 79) have been used in the exercise of the same the topic.
- Community work done by both boys or men and girls or women has been presented in grade 9, Pg. 83 and grade 10, front page and 31.
- Regional differences are explained with differences in the dresses of both men and women (Grade: 9, Pg. 104).
- Respect to mother, father and male and female teachers has been mentioned in the topic of Cultural Values and Institutions.
- The Units "Reproductive Health" of grade 9 and "Safe Motherhood" of grade 10 are important for growing girls and boys. Although the concept of safe motherhood may not apply to them immediately, it is important to have knowledge about these things, especially for those who, for various reasons, may not be able to continue their study (after secondary level).
- The statements found in the sub-topic of "Involvement of Women in Planning of Family" (Grade 10, pg. 20) make it clear that the issue of reproductive health continues to remain a hidden and neglected issue in our society. Therefore, in order to enable women to raise the issue, women health volunteers or housewives can be appropriate change agents.
- Similarly, there are sub-topics related to legal age of marriage and disadvantages of early marriage (Grade 10, Pg. 23 and 24), which are gender empowering.

Things to be reformed

- The textbooks should convey a message that the ideal number of children does not always mean a son and a daughter (Grade 9, front page; grade 10, Pg. 2, 7, 8, 30, 39). It may be both sons or both daughters, or one son or one daughter and a disabled one.
- The front page of grade 9 portrays a stereotypical image of woman as 'nurse' examining the health of a boy child.
- The total number of people involved in preparing the textbooks of grades 9 and 10 are 18 and 19 respectively. Of them, the members of the team for grade 9 are all men, while

one of the members of the team for grade 10 is woman (5.3%). This is nothing more than a formality.

- The total number of population in different decades, its regionwise and castewise distribution, the distribution of different language-speaking people, of those who follow different religions with diverse ethnicity and the data of occupationally involved and economically active population have not been presented in a gender-disaggregated manner.
- The Unit of “Demography” of grade 9 has no sex-disaggregated information. Similarly, in grade 10, the data of old people, life expectancy and child mortality rates in different countries in different decades (Pg. 17, 92 and 101) do not provide sex-disaggregated information, an essential means to have real information about the population and its characteristics.
- In the sub-topic of ‘Generational Respect’ of grade 9 is written: *“Due to the pressure of the household head and other elders, daughter and daughter-in-laws cannot express their views about taking family planning services or decide the number of children they like to have as a result of which they are forced to reproduce more children”* (Pg. 47). Such things, also observed in Population and Environment Education books of secondary and lower-secondary levels, assume that it is women who are responsible for producing more children. But the textbooks ignore:
 - The role of men and their attitudes towards their wives and about sexual relationship,
 - The quality of family planning devices, and
 - The women’s burden of work which does not allow them to visit doctors or health centers more frequently.

These days, many women, both rural and urban, are suffering from unwanted pregnancy. None of the temporary (even the permanent one) family planning devices have proved to be totally safe for women. Sometimes, they even resort to very unsafe and risky abortion and tend to suffer from various problems and diseases related to their reproductive health. So, before blaming the victims, the issue should be properly analyzed and right messages disseminated to the children.

- In an exercise related to demography, it has been asked to collect information about live births, deaths and migration of 20 families in a non-sex-disaggregated way.
- The Unit 3 of grade 9 titled “Causes of Population Changes” has a paragraph on ‘Status of Women’, which states that *“Women’s works are limited to only household chores and it is, therefore, natural for them to have more children. But if they would have had access to education, & opportunity to work outside, they would have limited time to bear more children and far less time to bring them up. As a result, fertility rates, with their change in attitude, would have come down (Pg. 57).”*
 - First of all, status of women can’t be explained in one or two paragraphs and therefore, the way it has been presented misinterprets their status.
 - Secondly, this statement again assumes that it is women who are responsible for increasing birth rates and they have nothing to do with home except doing a few easy and valueless household works which are hardly recognized.

- Thirdly, mobility, education and employment are necessary for women for their independent personality development and not just for getting out of the fertility trap.
- Similarly, one of the social elements of population changes as mentioned in the textbook is rural-urban migration written as *“from rural areas, students, teachers, professors and artists come to the urban areas for education, teaching and carrier development”* (Grade 9, Pg. 62). The neutral words, e.g., students, teachers and professors, used here perpetuate androcentric bias and neglects the compulsion of migration which rural young women are facing nowadays.
- Productive works by men, e.g., teacher, doctor (even the patient), artist, blacksmith, driver have been presented (Grade 9, Pg. 64, 83, 146).
- The topic Cultural Values and Institutions (Grade 9, Pg. 110) is briefly and neutrally dealt with. But women are highly discriminated against in society in the name of cultural norms and values.
- In the Unit of Reproductive Health of grade 9, there is a sub-topic titled ‘Measures for Controlling Abortion and its Consequences’, where it is written *‘Abortion is to kill or destroy (tuhaunu, in Nepali) the fetus before it comes out as a baby. People do it knowingly or unknowingly.’*
 - First of all, the sub-topic should be changed to ‘Control of Unsafe Abortion and its Consequences.’
 - A lot of mothers are suffering from various reproductive health problems due to unwanted pregnancy. A mother never wants to kill the fetus if she has any control over it. Thus, the language used in the textbooks should be very sensitive to preserve the individual’s identity and images irrespective of their class, caste, ethnicity and gender.
- Again in the Unit of ‘Population Management and Environment Conservation’ of grade 9, some paragraphs on ‘Status of Women and Education’ and ‘Gender Equality’ have been included (Pg. 190 and 191). Today, the real issue is not one of including women or gender in any topic; the real issue is of gender mainstreaming in terms of women’s access to and control over education in achieving the goal of gender equality in education.
- In grade 10 (Pg. 1 and 3), the topic of ‘Family Life Education’ has highlighted the importance of family and its members where they get love, support, care and respect from each other. Though it is true in general, the issue is:
 - Who cares whom and who gets privileges in terms of getting care and support from the family?
 - Is there equal sharing in household chores in the family?
 - Is there equal distribution of food and other household resources among the family members of the same category?

Thus, generalization of the concept, values and morals of family may frustrate the grown-up children when they themselves face the reality of cooperation and conflict among the family members. So, they should be equipped with the knowledge about the changing family and social structure, cultural values and norms. Only then can they be able to cope with the situation.

- Food serving is considered only as women's duty (Grade 10, Pg. 7, 30). It can be presented as all members sitting together and serving foods for themselves or to each other.
- Family Life Education has another topic titled "Responsibilities of Parents" and a lot of responsibilities have been allocated to would be parents. Here, the need is to make the children aware of their own responsibilities towards their parents. Nowadays, children are found to be far more sensitive about the community and environment outside their homes than about their family and parents, so this should also be an issue for family life education.
- The Unit 2 of grade 10 is about 'Quality of Life.' Here the quality of life is associated with women's education and their involvement in skill and income-generating activities, especially for the welfare of their family (Pg. 29). Similarly, the sub-topic of 'Income of Family', says: "*The women who are living ideally at home as housewives should be involved in small or medium income generating activities in order to increase the income source of their family*" (Pg. 32). Such stereotypical interpretations are in no way likely to empower women.
- The topic of the Unit 4 is 'Consumer's Health' and its sub-topic is 'Cosmetic Goods and their Effect on Health' (Grade 10, Pg. 75), where it is mentioned, "*in order to make their physical appearance good-looking, people use various kinds of artificial cosmetic items and fashionable goods forgetting the benefits of natural beauty. To have beautiful skin, people use various types of cream, lotion and face-packs and put on pencil heeled-shoes in the name of fashion...*" Here also applies the issue of gender sensitivity in the use of language for the textbooks.

Importance given to family and family life education in the textbooks shows that the writers are well aware of the changing forms of family and the concept of family life. So they want to maintain the existing family structure making children aware of the importance of an "ideal" family life.

2. Computer Science

Positive Aspects:

- A female name has been identified in the history of computer science. Lady Augusta Ada Lovelace, a European mathematician, was the first computer programmer in the world (Grade 9, Pg. 9). Due to her contribution to programming, a language called Ada, used in USA defense, was named after her (Pg. 59). This recognition of women's contribution in the development of information and technology is a pioneer step towards encouraging girls and women in this sector of learning and generating knowledge.
- Use of gender neutral words, e.g., *students, teachers*, etc. in the introductory parts of each grade.
- In the topic titled File Management, both female and male names have been used in saving documents and listing names in the Table (Grade 9, Pg. 139, 140, 163, 182, 184, 243), e.g.,

- Meena doc., Nabina doc., Nanu doc., Jaina, Malika, Pujeeta, Nabina, Jurina, Jenisha, Bimala Kheral, Muna, Tara, Ritu, Situ, Rosy (38.5 %)
- Mukesh doc., Nirmal doc., Pujan doc., Rupesh doc., Rabi, John, Rabin, Albert, Rupal Shrestha, Keshav Kheral, Yadhav Kheral, Hari Gopal Shrestha, Ram Krishhna, ... (61.5 %). Though male names have been more frequently used than female names in the text, the inclusion of both male and female names in Computer Science can be taken as an example of gender awareness.
- Basically the contents of both grades 9 and 10 are descriptive and informative. They are, however, gender neutral.
- A picture of grade 10 shows a woman sitting at the computer trying to email her friend (Pg. 8). This shows the changing social reality.
- In the topic titled “dBase” of grade 10 (Pg. 74, 76, 77), a list of names with their sex, class and phone numbers has been given of which nearly 35 percent are girls or women.
- In the last exercise, there are some questions (Q. Nos. 4 and 19 of Pg. 120 and 123) asked to make a program file of “short information about your teachers” with their name, sex, age, marital status, etc. Here the most important thing is to identify the sex of teachers which, in other words, means recognizing the presence of female teachers at school.

Things to be reformed

- Front pages of both grades 9 and 10 show a boy sending a message using a computer. This seems to convey a message that science and technology is the man’s field.
- In the textbooks preparation teams of both grades 9 and 10, there are 16 and 19 members respectively. The members of the team for grade 9 are all men, while one of the members of the team for grade 10 is woman.
- Similarly, in grade 9 (Pg. 4), importance of computer education has been highlighted since “*It is extremely important for doctors, engineers, managers, professors, researchers, mathematicians, scientists, industrialists, students, computer teachers, etc.*”, which indirectly perpetuates the centrality of men or androcentric biasness. This is further clarified by the examples given below (Grade 9, Pg. 171, 174 and 242):
 - Rajan Joshi: Doctor; Shayamesh Shrestha: Lecturer
 - A salesman and *his* sales and *his* commission (Pg. 242)
 - A personal computer user and the files on *his* computer (Pg. 174)

3. Compulsory and Optional Mathematics

- In the textbooks of both the compulsory and optional Mathematics of the secondary level, use of language in general is gender neutral.

3.1 Compulsory Mathematics

Positive Aspect:

- In the first Unit of grade 9 (Pg. 4), an exercise has been included to prepare a set of girl students.
- Use of few gender-responsive words, e.g., male and female teacher, male and female students and son and daughters (Grade 9, Pg. 9, 197 and Grade: 10, Pg. 8)

- In Exercise No. 3.2 of grade 9 (Pg. 36), works to be carried out by male and female have been mentioned.
- Female wear (e.g., sari) has been also recognized in the exercise (Grade 9 Pg. 49) rather than male wears only (e.g., cap, grade 9, Pg. 49).
- Like at lower-secondary level, female names have been associated with money (Grade 9, Pg. 51) and fruits (Pg. 51) in few cases.
- The concept of an earning or economically independent woman has been introduced in an example of grade 10 (Pg. 8). “*Annual income earned by a married woman or a man with three children, both son and daughter...*’ has been mentioned here.
- The Unit 13 of grade 10 has some exercises, which mention “*the presence of male and female students in a quiz contest and probability of the birth of male and female child*” (Pg. 147 and 153)

Things to be reformed

- Women’s participation in the process of textbook preparation is only 8.3%, that is, there are only two women out of 24 members. The names have been given just for the sake of formality.
- As at lower-secondary level, male names have been more frequently used than female names in the examples and exercises of secondary level Mathematics.
- As at lower secondary level, every demographic data should be gender-disaggregated, e.g., number of births and deaths, number of tourist arrivals, the number of students, marks obtained by the students, the breakdown of population age-groupwise, income of the people, number of workers in a factory, number of hours girls and boys study and their performances in the examination, the number of persons visiting through taxis, etc. (Grade 9, Pg. 41, 43, 192, 194, 197, 198, 201-208, 216; grade: 10, Pg. 3, 20, 24, 124-139). It is because:
 - Nowadays, the number and sex of children can be also socially determined.
 - Death rates which can be also socially determined due to sex selection before child-birth, unequal distribution of household resources and community health services, less preferences given by girls/women to their own health and socialization and not sharing their reproductive health problems with any family member.
 - Wages of male and female workers in the farm and factory are socially determined.
 - Number of male and female students in the school shows socio-economic distribution of household and community resources.
 - Number of hours girls and boys study in a week may be different due to social values and beliefs. Thus, to enable students to know and analyze the situation, gender-disaggregated information is necessary.
- Men are in public places as shown in the pictures, like *a boy flying a kite sitting on the ground* (Grade 9, Pg. 27).
- As at lower-secondary level, uses of gender neutral words, e.g., person, finance officer (*manish* in Nepali), landlord, farmer, commission agents, buyers and sellers and administrative workers are perpetuating the male biases. For example:

- All the above-mentioned neutral words are associated with male verbs (Grade 9, Pg. 29, 41, 42, 46, 47, 49, 60 and 200; grade 10, Pg. 1, 2, 7, 13, 124-139)
- In pictures (Grade 9, Pg. 47, 116, 128) also, only men are shown as buyers, sellers, players and traffic policemen.
- As in other levels, male names are mainly associated with money (Grade 9, Pg. 42; grade 10 Pg. 16) and calorie food (Grade 6 Pg. 73, 130, grade 7, Pg. 60), whereas female names are associated mainly with bread (Pg. 66, Grade: 7, Pg. 60), ribbons, etc.
- There are some typical examples of father and son (Grade: 9, Pg. 124 and 125) directly perpetuating androcentric biases.

3.2 Optional Mathematics

Basically all the contents and exercises of Optional Mathematics are gender neutral.

Positive Aspects:

- The first Unit of grade 9 (Pg. 1) contains gender sensitive pictures by using both female and male names.
- In the first exercise of grade 10 (Pg. 7-10), there are some very good examples of engendering Mathematics where matrix addition and subtraction are done through the examples of the numbers of girls and boys in a school by taking one category of data (of girls/boys) as matrix A and another category of data as matrix B.

Things to be reformed

- No representation of women has been made in the 15-member and 19-member textbook preparation and development teams for grade 9 and grade 10 respectively.
- In the Unit 6 of grade 9 (Pg. 202-222), there are various tables showing age-wise distribution of population, marks obtained by the students and wages of the workers. But as there is no gender-disaggregated statistics, the information and facts remain incomplete.
- In grade 10 (Pg. 16), there is an example of a male name associated with money.
- In an exercise (Grade 10, Pg. 101), the neutral word 'bank officer' associated with money is likely to reinforce male biases with the use of the verb that goes with male in Nepali.

4. Science

Positive Aspect:

- Women's participation in textbook preparation and development process is about 17-18 percent in grades 9 and 10.
- The textbooks of all three grades are more informative and written in the gender neutral language, using the pronoun "You" in the main text, examples and exercises.
- As at lower secondary level, either human beings or the hands of person have been used in every scientific experiment (Grade 9, Pg. 7, 29; grade 10, Pg. 8, 20, 26 and 57).
- In a picture in the book of grade 9 (Pg. 24), a pulley (locally known as *ghirni*) is being used by a woman to fetch water. From a gender perspective, the picture has two meanings:

- First, women started having an access to technology and are capable of handling it. It can therefore be explained as a gender empowering example.
- Second, both men and women are sharing household work. But the man looks tired and exhausted, while the woman looks cheerful and this is not good from the viewpoint of gender equity and equality.

Things to be reformed

- As at lower-secondary level, theories and principles propounded by only men are mentioned or recognized in the textbooks. Newton, Mendel, Darwin, Wallace, etc. (Grade 9, Pg. 12-20; grade 10, Pg. 155-167) can be taken as examples.
- Only boys have been presented in the pictures of grade 9 and 10 (Grade 9, Pg. 21, 159, 186; grade 10, Pg. 13, 40)
- In some examples, neutral words such as wage labor, person, etc., that take male verbs with them have been used (Grade 9, Pg. 21, 22, 34) trying to give a message that all the neutral words used for addressing people or to professionals are actually addressed to men.

Primary Level**1. Mathematics****Positive Aspect**

- Front page is gender balanced with both pictures showing boys and girls trying to solve mathematical problems.
- Women's involvement in the manual development process is 33 percent, that is, one of the three-member team was woman.
- The gender-responsive words *Bal-Balika* (in Nepali) have been used in some places.
- The gender neutral words such as students, teachers, person or human (*Manish* in Nepali) have been used in many places.
- Women have been also presented as being involved in money related examples (Grade 4, Pg. 34, 39)

Things to be reformed

- Androcentric or male biases
 - Though girl names have been used in the manual (Grade 4, Pg. 34, 39), boy names are more frequently used (Grade 4, Pg. 32, 34, 50, 38, 39, 52, 53, 57).
 - Men's mention in examples involving money (Grade 4, Pg. 32, 38, 50, 52, 53) is more than that of women or girls.
 - Only boys have their access to physical resources, e.g., fruits, livestock, etc. (Grade 4, Pg. 57, 60, 61).

Secondary Level**1. Mathematics****Positive Aspect**

- The introductory chapter is titled 'Equal Access to Education for All Students.' As suggested by the title, the chapter looks to be very much gender sensitive. There are instructions as well as measures proposed for ensuring equal access to education to one and all. From the gender perspective, the positive characteristics of the measures are as follows:
 - Equal treatment to all students including girls and other disadvantaged groups, with equal educational opportunities,
 - Concept of gender-friendly classroom,
 - Promoting active participation of girls and boys in classrooms; encouragement is needed to both girls and boys who are shy and hesitant to attend the classes.
 - Gender-balanced seating arrangements,
 - Dynamic role of teacher or instructor to reach the goal of gender equity and gender equality in education,

- Encouraging poor girls and boys in Science and Mathematics by providing the opportunity of mutual learning,
- Additional support to girls in Science and Mathematics because they normally don't get enough time to practise these subjects at home,
- Providing equal opportunities to girls and boys to participate in the class,
- Continuous encouragement and support to good girls and boys in the class.
- Enabling girls and boys to understand their similarities and differences (both biological and social) in order to promote respect and understanding with each other,
- Enabling them to understand their own capacity and skills and supporting them to enhance these skills and capacities positively,
- Promoting economic independence,
- Extra attention to adolescent girls and boys and help them solve their problems,
- Safe and healthy school environment, free from any forms of discrimination, harassment and biases.

Thus, the instructions, if implemented properly, are equity based, gender empowering and gender equality oriented.

- In the contents, there is the use of some gender responsive words such as girls and boys, and male and female teachers (*Bal-Balika* and *Shykshyak-Shykshyika* in Nepali).
- Gender neutral words such as students, teachers, administrative staffs, business owners, tourists, etc. have been also used in the contents.
- Similarly, gender neutral language has been used. Conscious efforts have been made not to address any particular gender.

Things to be reformed

- No women have been represented in the manual preparation and development team. All the 12 members of the team are men.
- The introductory chapter seems to be much more gender-sensitive, but this is not followed in the same spirit in the course contents.
- Some exercises are directly addressed through male names (Grade 10, Pg. 19).
- While suggesting forming groups in the text, there should have been instructions to equally represent girls and boys, which is not found in the manual (Grade 10, Pg. 23).
- Exercises addressing father and son only should be avoided (Grade 10, Pg. 51).
- In Statistics also, none of the data about the marks obtained by the students, savings and expenditures of the people, weekly wages of the workers, etc. are gender-disaggregated. These variables are much more influenced by gender roles and responsibilities, socialization patterns, and attitude and behavior of the people. Therefore, without gender disaggregated information, use of such data in Mathematics is only for the sake of doing mathematics. There will be no place for subjectivity in the teaching and learning of mathematics.

2. Health, Population and Environment Education

The manuals of grades 9 and 10 are very much similar to the textbooks of Health, Population and Environment.

Positive Aspect:

- As in Mathematics, there are common introductory chapters full of gender sensitive measures/instructions to inspire and encourage girls and boys equally.
- Generally the contents of both grades are gender neutral but efforts are also to have been made to follow gender-sensitive instructions given in the introductory chapter.
- Since the very beginning of the manuals of both grades, gender-responsive words such as ‘male and female teachers’ (*Shykshyak-Shykshyika* in Nepali), ‘mother-father’ and ‘son-daughter’ have been used.
- There are also simultaneous uses of the gender neutral words ‘teachers (*Shykshyak* in Nepali), students’, etc. in both grades.
- There are some pictures (Grade 9, Pg. 27) that portray regional, cultural, ethnic and gender balances.
- Sex-disaggregated population statistics, e.g., total number of population in different decades, sex and age wise distribution (Grade 9, Pg. 29-31) of population, etc.

Things to be reformed

- The 11-13-member teaching manual development team has none of the women.
- Though the contents have been developed according to gender sensitive instructions given in the introductory chapters, there are still some points that need to be reformed. For example:
 - Population statistics or demographic features such as birth, death and migration rates (Grade 9, Pg. 19, 33), occupational distribution of population, economically active and dependent population, and population of the employed and unemployed should have sex-disaggregated data and interpretation.
 - While discussing the causes and consequences of migration, the issue of trafficking and women-headed households should not be avoided.
 - While forming groups (Grade 9, Pg. 17, 53; and grade 10, Pg. 16), there should have equal number of girls and boys. This should be mentioned in the manuals.
 - Importance of breast-feeding should also address the enabling condition of breast-feeding mothers. To breast-feed their children, mothers should have their breasts full of milk. Therefore, the topic ‘Safe Motherhood’ should include the food behavior of the breast-feeding mother and calorie requirements to them.
- In the topic of psychological aspect of population changes (Grade 9, Pg. 53), there are some questions including ‘*Do men want to produce children?*’ But there should have been some other questions in the same topic, e.g.:
 - ‘*Do women want to produce more children?*’ Go on bearing children is women’s desire or helplessness?
 - How accessible and effective are the family planning devices, especially in terms of women’s reproductive health?
- As mentioned in the textbooks review also, it is unfair to limit the issue of women’s empowerment and gender equality to a few paragraphs.
- In grade 9 (Pg. 77), there is a picture of a health post or a doctor’s clinic where a male doctor is examining a male patient, emphasizing that men’s health care is more important than the women’s. Thus, the traditional biases have been perpetuated.

- Similarly, in another picture (Grade 9, Pg. 84), both men and women are applying for employment. Although it is a symbol of mobility and independency, especially in the case of woman, the meaning of employment is narrowly defined as office work only.
- Another stereotypical gender biased concept is to present only women in water taps, (washing clothes, grade 9, Pg. 86) and kitchen (serving foods, Pg. 90), whereas men are never seen in the kitchen and washing their clothes, which is neither possible nor applicable in the changing social realities.
 - If manuals repeat the same attitudinal bias, then teachers (the change agents of the community) also disseminate the same message, and
 - The children (grown-up boys and girls) also get equipped with the same thinking and try to behave accordingly in their life.
- In pictures, women are shown involved in community works (volunteer works, grade 9, Pg. 105, 119, 175), but in productive works only men are presented, though it may be only small-scale household businesses (Pg. 105, 163, 181, 182).
- Though women are nowadays shown involved in public spheres through community works (in textbooks and manuals), in the case of worshipping God, there is still public-private dichotomy. This dichotomy has been portrayed in the manual through pictures where men of different religion (Hindu, Muslim, Buddhist, grade 9, Pg. 127) are shown as religious priests.
- While highlighting the importance of family life (Grade 10, Unit 1), the importance of the roles, sacrifices and mutual understanding of the family members and sharing of HH works among themselves also should have been mentioned.
- The Unit of 'Roles and Responsibilities of Parents' should also include roles and responsibilities of children towards their parents. The girls and boys studying at secondary level are children of today but parents of tomorrow. So while making them aware of their future roles, they should be also made aware of their present roles and responsibilities.

Higher Secondary Level

1. Mathematics

Positive Aspect:

- Use of gender neutral language all over the contents of grade XI and XII.
- Use of gender neutral words, e.g., students, teachers, etc.

Things to be reformed

- No women were involved in the preparation and development process of manuals for grades XI and XII.
- Although there are uses of gender neutral words, e.g., students, instructor and Math teacher, in specific objectives of grade XI and in its first Unit the word '*Balak*' has been used (Pg. 2, 8-13, 17), reflecting androcentric biases.
- The theories propounded by male scientists, e.g., Piyaje Theory, Lami's Theorem and Newton's Laws have been included in the specific objectives of grade XI and in the contents of both grades (Grade XI, Pg. 8-11; grade XII, Pg. 62).
- As at secondary level, while forming groups of students, there is no mention of gender-disaggregated word (Grade XI, Pg. 15, 18; grade XII, Pg. 11)
- Similarly, in Statistics of grade XII, there are various data and statistical tools used, but they have no gender-disaggregated information.
- All the textbooks and reference books written by male authors have been prescribed in higher secondary Mathematics.
- In order to engender Mathematics, word problems, examples and exercises used in Mathematics should be gender-responsive showing different roles and responsibilities of women and men.

2. Computer Science

Positive Aspect:

- Manuals of both grades are gender neutral and have used such words as students, teachers and gender neutral languages

Things to be reformed

- There is no women's participation in the manual preparation process. Therefore, equal participation of women in the process is recommended to ensure a balanced gender perspective in Computer Science.
- To make girls competent in this rapidly growing sector, extra efforts are needed to attract, encourage and motivate girls.

3. Physics, Chemistry and Biology

Positive Aspect:

- As Computer Science, the manuals of Physics and Chemistry are also gender neutral with the use of gender neutral words, e.g., students, teachers and gender neutral languages.

Things to be reformed

- There is no participation of women in the manual preparation and development process of Physics, Chemistry and Biology.
- Some topics of Unit 7 of grade XII, Physics are about 'Energy Crisis' and 'Pollution', explained in a gender neutral way. In reality, women and men do not equally feel energy crisis and pollution (air, noise and water). Some are still considered as the main provider of family foods. Thus, women suffer more from energy crisis than men. Similarly, pollution affects women more than men as the former have the responsibility of producing children. Thus, any effect to her reproductive system may affect the health of future generation.
- In Chemistry, *Chemistry in the Services of Mankind* (Grade XII, Unit 9 Pg. 44) should be replaced by "*Chemistry in the Service of Humankind.*"
- Although the manual of Biology seems gender neutral, the Unit 4 of grade XII (Pg. 44) has examples of androcentric biases. The specific objectives and description of the contents repeatedly use 'Man' in analysis.
- Beside, all male-written textbooks and reference books are prescribed in Physics, Chemistry and Biology.

Appendix 6 d *Summary and Recommendation of the Gender Sensitivity Analysis of the Curriculum*

Primary Level

- The objectives of primary level education are based on national goals of education, which aim “to develop personality and inherent talent of each person.....” Instead of using the term “each person”, it would be better to include “each person irrespective of their class, caste, ethnicity and gender” to make the objectives more gender sensitive. Similarly, the sixth objective mentions that, “Education will facilitate in mainstreaming the individuals” In order to reflect the government’s national and international commitments and development plan objectives in the national goal of education, the sixth objective could be modified as, “Education will facilitate in mainstreaming gender in access to and control over education”.
- At primary level, although the introductory part depicts the rural-urban bias, one of the objectives aims at developing respect to all religions, castes, cultures and ethnicity and it also makes the children feel and realize gender equity (objective 5 reflects a balanced perspective on gender, class, caste, ethnicity and religion). Generally, the curriculum is gender sensitive and is trying to address the diversities and inequalities prevailing in Nepalese society.
- There are uses of few gender responsive words, e.g., *girls and boys* and *male and female teachers*. The gender neutral words, i. e., *students* and *teachers* have been also frequently used.
- Neutral treatment of girls and boys in Mathematics, Science and Health and Physical Education by keeping “*students*” at the center of analysis.
- Neutral explanation in Health and Physical Education has neglected differential health and nutritional needs of men and women.
- Instructional strategy seems flexible, supportive and facilitating to the children, but fails to consider differential position of girls and boys in the family and society.
- ‘Regular or Continuous Evaluation Process’ adopted for primary level is gender neutral as there is no sex-disaggregated recording system for progress monitoring.
- On the one hand, it is more flexible and child friendly. Small children do not feel any burden of final examination and take schools as a venue from where they can draw inspiration for learning. On the other hand, girls are the one, who mainly remain absent from the class due to various factors that are related to poverty and patriarchy. So, through this process, they cannot score good points and the probability of the girls being fail is high.

Lower-secondary Level

- Both general and specific objectives are gender neutral.
- In each subject generally the term “*students*” has been used and the contents are elaborated neutrally.
- In Science and Technology, neutral explanation of objectives, contents and instructional strategies does not realize that girls and boys may possess some gender specific practical

(indigenous) and theoretical knowledge, thereby neglecting the opportunity of mutual learning.

- Neutral explanation of Physical Education does not realize the need of physical education equally to both sexes.
- Marks allocated to Health and Physical Education are only 50 and this does not match with its importance. Students' performance evaluation form for Physical Education has separate columns for girls and boys, which is very much necessary for gender equity.
- Instructional methods are generally explanatory but are written in the gender neutral language.
- As regards evaluation, regular evaluation and final examination methods are used with marks carrying 40 and 60 respectively. Regular evaluation process mainly benefits the girl and boy students, who are regular in class.
- In Population, Health and Environment Education, instead of including a unit or a topic related to women and gender, all issues of population, health and environment should be dealt with from a gender perspective. For example, situation and characteristics of population, its causes and consequences, environmental changes, adolescence changes, reproductive health and the need of sex education should have gender sensitive interpretation.

Secondary Level

- In the main objectives, a lot of qualities have been expected from secondary level graduates without realizing the need of gender sensitivity.
- In Science, male scientists-propounded theories and principles are mentioned in the curriculum.
- The curriculum of Health, Population and Environment Education seems a huge compilation of three different subjects.
 - There are some topics such as 'Reproductive Health' and 'Reproductive Rights' which are much relevant to the growing children.
 - Besides, other topics related to population and its characteristics should be also analyzed through gender disaggregated statistics and interpretation.
- Instructional strategies and evaluation methods are gender neutral.

Higher Secondary Level

The main objective is to produce medium-level skilled human resources by providing educational opportunities to all.

- Inclusion of gender-responsive words such as "*son and daughter*" in objectives gives a sense of gender awareness in higher secondary education.
- Mathematics, Science (Physics, Biology and Chemistry) and Computer Education curriculums of higher secondary education are basically gender neutral but there are uses of some words such as *manpower* and the pronoun *He*, which promote the centrality of man.
- Although the curriculum of Population Education is gender neutral, one of the objectives, e.g., '*taking rational decision about desired family size*' is vague as it is not clear what is the desired family size and who makes decisions about this. There are topics related to women and their lives, e.g., '*status of women and children*,' but their inclusion is

not enough. Rather all the population-related issues should be examined and analyzed from gender-sensitive lens.

- Similarly, Health Education cannot be generalized as family health. *Health and nutritional needs, problems and access to health services for men, women and children are different with family.*
 - There are many inclusions of gender and women's issues including the concept of *responsible parenthood*. Again, the inclusion of gender issues in some units is not sufficient.
 - In Physical Education, only male-centered playing items are mentioned in the curriculum e.g., basketball, football, volleyball, kabaddi, etc.
- Use of gender neutral words and language in curriculum objectives, contents and instructional strategies are often found misinterpreted against gender equity in the textbooks. The contents and exercises are often prepared from men's perspectives, only highlighting their contribution and associating them with knowledge, information, power and money, whereas women are associated mainly with long hair, ribbons, ornaments and beauty, confining women/ men to the same gender stereotypical images and qualities.

Recommendations

Participation of women/men in the process of curriculum preparation and development:

Equal participation of women and men in the process of curriculum preparation and development has been recommended.

Gender-responsive objectives: Objectives of all levels should be gender-responsive addressed to both girls and boys or male and female students.

Use of gender-disaggregated words: Use of gender-disaggregated words, e.g., girls and boys, male and female teachers, and male and female intellectuals and professionals has been recommended to ensure gender equity and protect their right to have a distinct identity of their own and be recognized.

Use of gender-sensitive language: The language used in the curriculums should also be highly sensitive to preserve every individual's identity and images irrespective of their class, caste, ethnicity and gender. This should be mentioned in the objectives of the curriculums so that the textbooks and teaching manual writers would follow the process.

Gender sensitivity in educational personnel of all levels: This is recommended to ensure gender sensitivity in every level of educational planning and programming process.

Institutionalization of the process of curricular material review: The prepared curriculums should be reviewed from gender lens before sending them to the final users. This process needs to be institutionalized so that every curriculum revision or development would go through gender review.

Recognition of female scientists to inspire girls: In secondary school level science, only theories and principles propounded by male scientists have been mentioned, e.g., Newton, Pascal, Ohm, etc. Therefore, efforts should be made to incorporate pioneer women scientists to inspire girls.

Centrality of analysis: In every issue to be analyzed, the central figures should include both men and women rather than either of them.

Removal of androcentric biases or male perspective from the curriculum: Generally neutral explanation of contents or any issues to be analyzed perpetuates the androcentric or male biases in the curriculum. Therefore, special attention should be given to the topics related to:

- Household works and their importance to boys and girls in order to make them independent,
- Nutritional needs of boys/men and girls/women in different stages of life (e.g., childhood, youth, adult and old age),
- Contribution of men, women and children in farm and non-farm production and the issue of recognition,
- Participation of women and men in planning and decision-making process in household, community and local government bodies.
- Explanation of fundamental rights of women and men from a human rights perspective, e.g., citizenship rights, property rights, right to work or choose occupation, right to get married, etc.

Extra efforts for girls' regularity at schools and their good performances in Science, Mathematics and Computer:

- For the time being, special attention should be given to inspire girls in the classroom and extra coaching provided in Science, Mathematics and Computer.
- Generally boys/men have more access to and control over information and technology. Since Optional Math and Computer Science are elective subjects, girls may not prefer to choose them. Special attention, therefore, should be given to encourage girls especially in classroom teaching/learning processes.
- Since the impact of computer may be both positive and negative, computer education should enable girls and boys to analyze its impact in a gender-sensitive way. The ethical aspect should be justified from a women's/men's human rights perspective.

Necessity of gender sensitive Health and Physical Education: In order to make children aware of the differential health and nutritional needs of men and women and its differential health impacts, Health and Physical Education should be gender sensitive. For example:

- Need of personal health care and hygiene for both girls and boys
- Need and importance of regular exercise and playing habits for a healthy growth of body to both girls/women and boys/men
- Need of extra calorie foods, sanitation and simple exercises during menstruation and pregnancy for girls/women
- In our society, girls generally do not play in their growing ages. At school, due to their uncomfortable dresses, they do not want to play, while at home, parents

don't allow them to play. They want their daughters to be engaged in household works. So health education need to be more sensitizing and encouraging to both girls and boys.

Gender sensitivity in Population Health and Environment Education

- In Population, Health and Environment Education of lower secondary, secondary and higher secondary levels, instead of including a unit or a topic related to women and gender, all the issues of population, health and environment should be analyzed from a gender perspective. For example, every population issue, e.g., number and trend of population growth, state and characteristics of population, causes and consequences of population and environmental changes, migration, adolescence changes, reproductive health, adult literacy, net enrolments, human resource development, etc, should have gender sensitive interpretation with the use of gender disaggregated statistics.

Gender sensitive evaluation process

From poverty and gender perspectives, the regular monitoring and evaluation process will not be just until and unless each parent becomes fully aware of education and there is some attraction in school (e.g., uniform, stationary, playing items, tiffin or lunch) for children. Thus,

- The effectiveness of regular monitoring and evaluation process needs to be assessed from gender and poverty perspectives.
- The form of evaluating performances should have sex-disaggregated recording system for progress monitoring.

Appendix 7 The Gender Gaps in School Enrollment (in percentage)

Level of school	Range of overall NER/District		Girls		National average	GPI: NER		GPI: GER		GPI: NER at all levels		GPI: GER at all levels	
	L'st	H'st	L'st	H'st		L'st	H'st	L'st	H'st	L'st	H'st	L'st	H'st
PL	56.3 Rautahat	97.9 Kavre	39.9 Rautahat	98.6 Manang	82.3	54 Mahottari	119 Sindhuli	54 Mahottari	107 Dadeldhura	55 Rautahat	105 Sindhupalchowk	52 Mugu	103 Ilam
LSL	10.9 Parsa	86.8 Kathmandu	8.2 Parsa	77.1 Kathmandu	40.4								
SL	5.8 Parsa	59.4 Kathmandu	3.6 Mugu	57.5 Kathmandu	27.5								

L'st: Lowest; H'st: Highest

Source: DOE, 2004

Table: 7 b. The Gender Gaps in Education (in percentage)

Indicators\Years	1981	1991	2001
Female percent among full time students	27.2	34.7	43.1
Number of women per 100 men			
Literate	33.8	46.3	65.8
With Primary Education	41.5	53.5	76.8
With SLC	22.2	31.2	55.5
SLC and Above	21.0	28.2	43.2
Graduates and above	18.4	22.5	22.9

Sources: Sahavagi 2004

Appendix 8 Gender Equality Measures Envisaged in Different Documents

Development Plans	Gender Parity and Equality Measures
Fifth Plan (1975-80)	Appointment of female teachers in primary schools in order to increase girls' enrollment
Sixth Plan (1981-85)	Special programs to provide educational opportunities to girls and women from educationally backward communities
Seventh Plan(1986-90)	Advocated for various incentive programs to girls such as scholarship, school uniforms, provision of hostels, free textbooks etc.
Eighth Plan	Continuation of incentive programs, implementation of BPEP, female teacher in each primary school, NFE for 6 to 14 years out of schoolgirls.
Ninth Plan (1997-2002)	Adopted mainstreaming, gender equality and empowerment- a move towards gender justice expansion of educational facilities and providing opportunities of quality education with continuation of BPEP
Tenth Plan	Continued emphasis on mainstreaming, gender equality and empowerment, trying to address the major problems related to education.
Education Act	<p>The Seventh Amendment to the Education Act (2001) includes some clauses that reflect some concerns of women. They are:</p> <ul style="list-style-type: none"> • Representation of a woman teacher in District Education Committee • A woman representative (social worker or educationist) in Village Education Committee • A woman representative in the School Management Committee from among the parents to be selected by the parents themselves • Special support for girl children and the students from the <i>Dalit</i> and underrepresented ethnic groups of below poverty line
Education Commissions	<p style="text-align: center;">Nepal National Education Planning Commission, 2012 BS</p> <p>This first National Education Plan has raised some of the issues in girls' education and suggested the measures as well. These measures include girls' school and girls' colleges, pro-girls approach in teacher training and parents' orientation programs.</p> <p style="text-align: center;">All Round National Education Committee 2018 BS</p> <p>This report is completely gender blind in the sense that different recommendations were made as regards various issues such as applying one educational system within the country, using the same medium of instruction all over the country, making education useful to the country, society and the citizen, providing special attention to the vocational education, achieving mass literacy, providing trainings useful to daily life, etc., but it did not mention anything about girls' backwardness in education, nor did it recommend any special provisions to uplift their position in education.</p> <p style="text-align: center;">National Education System Plan 2028-2032 BS</p> <p>This Plan had identified various problems in the education system and one of them was of the backward communities deprived of educational opportunities. But there was nowhere any mention of girls' and women's backwardness in education.</p> <p style="text-align: center;">Higher Education Commission 2040 BS</p> <p>Like the previous reports of the Committee and Commission, this report also did not mention anything about the education of girls and women. It, however, aimed at producing capable human resources for the nation's economic development by providing them knowledge and technical skills,</p>

Development Plans	Gender Parity and Equality Measures
	<p>and by developing a culture based on morality, self -help, respect to the thoughts and behavior of others, habit of hard work, creative thought, etc. This report also, as the previous ones, adopted the policy for creating suitable environment to bring the poor and backward communities within the reach of higher education bearing in mind the principle of balanced educational development among the people and geographical diversities of the country. However, the policies and objectives remained gender blind.</p> <p style="text-align: center;">National Education Commission 2049 BS</p> <p>The initial composition of the Commission formed during the interim government for the first time included two women members. But when the Commission was restructured, only one woman was retained. The Commission focused on the government’s commitment made in the Summit for Education for All held in Jomtien, Thailand in 1990 and to the declaration made by the World Summit for Children in New York, USA in 1990 and the Plan of Action formulated on that basis which aimed at achieving 70 percent of girls’ enrolment within 10 years. The report also aimed to reduce women’s illiteracy to 32 percent from 65 percent. The report had placed a special focus on women and the disabled, addressing the need of education for their independence for livelihood, for the balanced growth of the country as well as for social justice. It also pointed out the need of ensuring women’s participation in all the sectors related to education and stress was laid on the quality of education and social justice. It further said, if priority was not given to women to ensure their participation in social restructuring and development work by improving their educational status, nation’s development would take a long time to be realized.</p> <p>However, there was not much gender sensitivity in related sectors. For example, it was silent on female teachers and women at the decision making level.</p> <p style="text-align: center;">High Level National Education Commission 2055 BS</p> <p>The scope of work of the Commission for the first time included equal opportunities for the people who were backward, socially, economically and geographically, though the previous reports had also talked of providing equal opportunities in education. The report pointed out the need of at least one female teacher in the primary level. It further mentioned that the policy of one female teacher was found being gradually implemented and one of the problems identified was that girls as well as children of backward communities still were not participating in education due to social, cultural and economic reasons. Nevertheless, none of the suggestions made by the Commission was found to be gender focused.</p> <p style="text-align: center;">High Level Education Working Committee 2058 BS</p> <p>The suggestions made by Committee did not include any gender sensitive issue. However, the strategies had shown concern on the requirement for separate toilets for girls and boys.</p>
MOES’ Commitments and Efforts for Gender Justice	In order to achieve gender parity and equality in education, MOES has now adopted several policy measures. Those policy measures can be broadly categorized under five headings, (a) female teacher policy, (b) financial incentive policy, (c) non-financial support policy (d) advocacy,

Development Plans	Gender Parity and Equality Measures
	<p>and (e) institutional reform.</p> <p>The female teacher policy calls for at least one female teacher in each primary school. However, almost eight thousand primary schools have none of them. Several reasons can be attributed to this. One, there are no eligible females in the community to take up the position. Two, males are preferred to females if there is any vacancy at all. Three, surviving in and/or entering into a traditionally male-dominated workplace must be difficult for women. Nevertheless, the policy to allow temporary female teachers to attend the last package of the training as long as they have completed the previous ones, and the provision of award to the schools that recruit more female teachers are commendable examples of positive discrimination.</p> <p>The financial incentive policy is concentrated on providing monetary support to the girls from primary to higher secondary levels and prospective female teachers. But some packages also include non-financial facilities. Feeder hostel is an example. Theoretically feeder hostel provides room/board and monetary support for stationeries to the secondary level girl students until they complete SLC. But it has not been able to achieve its original intent for several reasons. As a result, the provision has been reviewed. Additional and some of the existing feeder hostels are proposed to accommodate those female students who would study in higher secondary level.</p> <p>Additionally, women in general and <i>Dalit</i> women in particular are selected and provided with scholarships to obtain pre-service teacher training. The financial support to the girl students aims at ensuring their access to and retention in the formal school education. Such supports are based on both meritocracy and attendance percentage. But there are other kinds of scholarship or financial support also which are provided irrespective of other things. In other words, a blanket approach has been used in providing such supports. There is also a provision for monetary award to schools that can enroll more girls. The assessments, observations and discussions at the field level, however, doubt the effectiveness of the financial support. Usually it is heard that such supports are inadequate, not helpful in changing beneficiaries' attitudes and beliefs towards girls' education, those who are not needy are also getting the scholarship and the blanket approach, above all, has not been helpful in ensuring equity since everybody, irrespective of their economic condition, is eligible. As a result, very little impact has been observed. The decline in girls' enrollment and survival in secondary education also supports this observation.</p> <p>The non-financial support policy aims at promoting girls' participation in formal education mainly by providing cooking oil to their families. The cooking oil is an incentive given to the families for sending their girls to schools. However, it is increasingly viewed as a bargaining chip, which may not guarantee girls' continued schooling after the incentive is stopped.</p>

Development Plans	Gender Parity and Equality Measures
	<p>Advocacy is generally applied to raise public awareness and sensitivity towards girls' enrollment in formal education. Posters, pamphlets, documentary films, hoarding boards, enrollment week, mothers' meeting, door to door visits are the major activities carried out to raise awareness about girls' education, thereby raising their enrollment. Gender related trainings are also provided to the teachers and other officers of MOES with the objective of gender sensitization at all levels and influencing policies, programs and practices.</p> <p>Institutional reform primarily indicates the establishment of Gender Equality Development Section in the Department of Education. GEDS replaced WES, which had, in turn, replaced Women's Education Unit established in 1992 at the ministry. Establishment of a gender focal person at the ministry was also a step towards reform at the institution level. Formation of the Gender Networking Committee is also noteworthy. However, neither of the change has been able to gain momentum towards achieving gender equality and gender mainstreaming in the education sector.</p>
EFA Plan of Action	<p>The Education for All Plan of Action in relation to social equity and gender parity in education has proposed four specific actions. These actions are: guaranteed access to education, guaranteed quality education, guaranteed relevancy in education, and gender parity and social equality in management. And, each of these actions has four more specific approaches.</p>
EFA (2004-2009) Core Document	<p>EFA Core Document has given emphasis to achieving the gender elimination goal set by the Dakar Framework of Action, and gender mainstreaming and social inclusion advocated by the Tenth Plan. According to the document, in order to achieve the gender related goals and objectives mentioned above, the Gender Audit (2002) will serve as the 'main guiding post.' According to the document, the female teacher recruitment will be accelerated through affirmative action. Likewise, policies to promote the role of women in the management of education at all levels and extensive community mobilization will be adopted to eliminate gender disparity in education. The document also proposes the gender sensitive curriculum, incentive schemes, and inter-sectoral coordination and collaboration in order to achieve gender related goals. The booster incentives for the out-of-school children and additional grants to the schools that recruit fifty percent female teachers in its total teaching staff are, for example, significant provisions made in the document.</p>
Secondary Education Support Program (SESP)	<p>SESP policy objectives are organized under three major areas- quality and relevance, access/equity, and institutional capacity. Its intervention areas include learning environment, curriculum development, assessment and instructional materials, teacher education and development, and institutional management and capacity building. Though the policy objectives are basically gender neutral, the second area, however, speaks about the provision of 'secondary education that fulfils particular needs to the girl child' (p. 41). The document lays emphasis on physical facilities, scholarships, locally determined curriculum within the national</p>

Development Plans	Gender Parity and Equality Measures
	<p>framework and gender sensitization as primary measures to achieve gender friendly school environment. The program also has provided for additional teaching allowance and housing facilities to those who are teaching in difficult and remote areas, and sensitization through pre and in-service teacher training. The document refers to GEDS as implementing partner. However, the provision to 'improve organizational structure of the DOE' (p. 95 of SESP document) is silent about the status and capacity of GEDS to achieve gender related objectives of SESP. The document is also silent on inter sectoral coordination and collaboration which is very important in order to fulfill the commitment of gender mainstreaming in the education sector.</p> <p>MOES' effort towards achieving gender equality and equity is praiseworthy. Almost all the divisions and sections have activities or schemes to achieve gender parity and gender equality. However, the efforts made to achieve gender parity and equality in education are scattered. GEDS which is supposed to take a lead in mainstreaming gender in MOES and/or ensure gender justice at all levels has not been able to do so. One of the reasons responsible for this situation is lack of one-door strategy for gender mainstreaming. On the other hand, the status that GEDS has in the bureaucratic channel has also prevented it from coordinating the efforts.</p>

Sources: SAHAVAGI, 2004, different education commissions reports.

**Appendix 9 a Gender Gap in the Pass Percentage of
Population and Environment Education STE Subjects**

Grade	Year	Population & Environment		
		Total	Boys	Girls
4	2058	83.93	83.56	84.3
	2059	85.41	82.68	88.14
	2060	89.3	90.2	88.4
5	2058	86.65	88.92	84.38
	2059	89.8	88.03	91.58
	2060	86.81	85.62	88
6	2058	16.42	17.44	15.4
	2059	17.94	19.32	16.56
	2060	17.22	17.86	16.58
7	2058	21.83	22.17	21.48
	2059	20.35	22.05	18.66
	2060	20.24	21.6	18.87
8	2058	25.59	28.62	22.57
	2059	20.25	21	19.51
	2060	20.32	21.75	18.88
9	2058	88.94	89.24	88.64
	2059	88.2	88.56	87.83
	2060	94.18	94.12	94.24
10	2058	95.81	96.73	94.89
	2059	94.65	95.18	94.13
	2060	82.75	83.51	82
11	2058	82.24	75	89.47
	2059	77.88	81.43	74.32
	2060	80.89	81.88	79.89
12	2058	95.45	90.91	100
	2059	94.44	100	88.89
	2060	96.48	100	92.96

Appendix 9 b

Gender Gap in the Pass Percentage of Mathematics

Grade	Year	Mathematics		
		Total	Boys	Girls
4	2058	56.6	58.82	54.39
	2059	64.27	63.64	64.91
	2060	60	53.33	66.67
5	2058	75.98	68.63	83.33
	2059	67.18	72.09	62.26
	2060	64.09	64	64.18
6	2058	60.6	65.26	55.93
	2059	75	63.79	86.21
	2060	48.72	51.39	46.05
7	2058	55.17	50	60.34
	2059	67.43	59.55	75.31
	2060	64.97	66.67	63.27
8	2058	64.95	62.5	67.39
	2059	66	72.55	59.46
	2060	65.24	65.33	65.15
9	2058	42	48.28	35.71
	2059	49.62	51.96	47.27
	2060	40.69	48.72	32.65
10	2058	45.26	48.1	42.42
	2059	33.8	44.07	23.53
	2060	56.94	63.89	50
11	2058	25	50	0
	2059	50	100	0
	2060	25	50	0
12		50	100	0
		0	0	0
		0	0	0

Appendix 9c

Gender Gap in the Pass Percentage of Computer Education

Grade	Year	Total	Computer	
			Boys	Girls
4	2058	0	0	0
	2059	0	0	0
	2060	0	0	0
5	2058	0	0	0
	2059	100	100	100
	2060	0	0	0
6	2058	0	0	0
	2059	100	100	100
	2060	100	100	100
7	2058	50	100	0
	2059	100	100	100
	2060	50	100	0
8	2058	0	0	0
	2059	50	100	0
	2060	0	0	0
9	2058	75	100	50
	2059	50	100	0
	2060	50	0	100
10	2058	0	0	0
	2059	50	100	0
	2060	50	100	0
11	2058	0	0	0
	2059	0	0	0
	2060	0	0	0
12		0	0	0
		0	0	0
		0	0	0

*Appendix 9 d**Gender Gap in the Pass Percentage of Science*

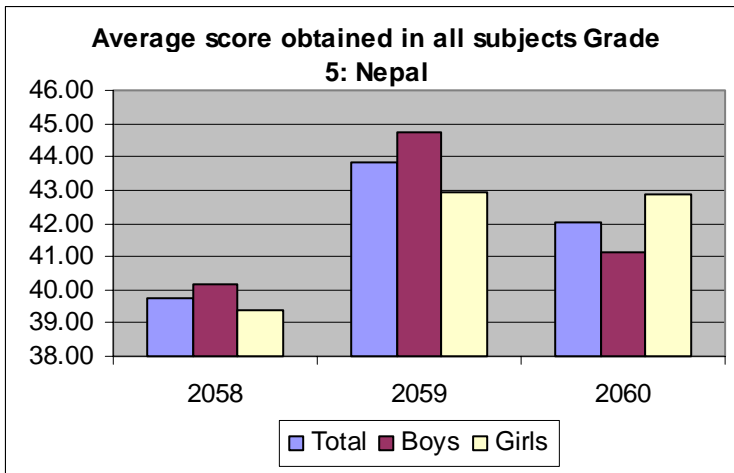
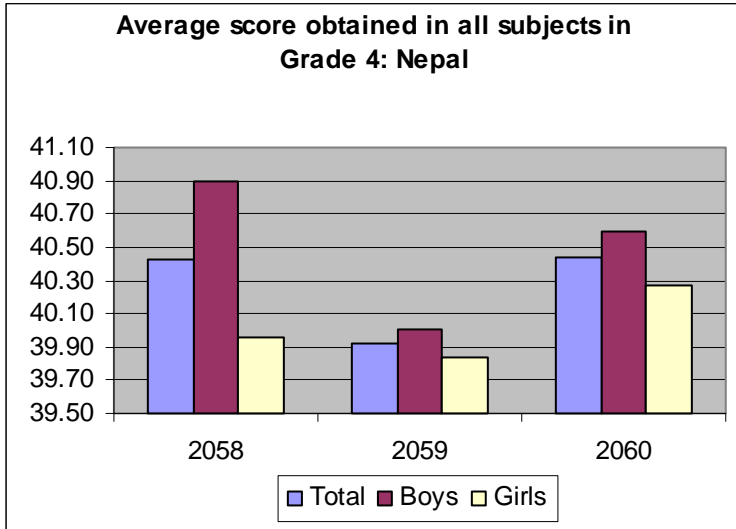
Grade	Year	Science		
		Total	Boys	Girls
4	2058	56.85	70.83	42.86
	2059	58.74	53.85	63.64
	2060	64.42	53.85	75
5	2058	69.78	53.85	85.71
	2059	75.29	65.22	85.37
	2060	69.43	52.38	86.49
6	2058	76.03	75.79	76.27
	2059	79.53	74.58	84.48
	2060	67.4	63.38	71.43
7	2058	81.19	79.63	82.76
	2059	77.58	76.4	78.75
	2060	85.69	81.58	89.8
8	2058	66.03	62.5	69.57
	2059	76.31	80.39	72.22
	2060	73.41	71.05	75.76
9	2058	67.13	61.76	72.5
	2059	71.57	64.29	78.85
	2060	71.08	68.25	73.91
10	2058	58.23	53.13	63.33
	2059	75.8	73.47	78.13
	2060	69.4	49.06	89.74
11	2058	25	50	0
	2059	50	100	0
	2060	27.78	55.56	0
12		85.71	71.43	100
		0	0	0
		50	100	0

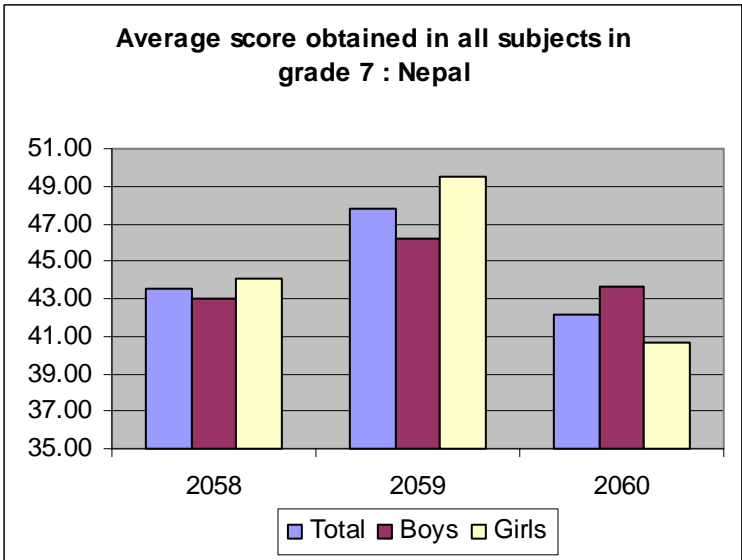
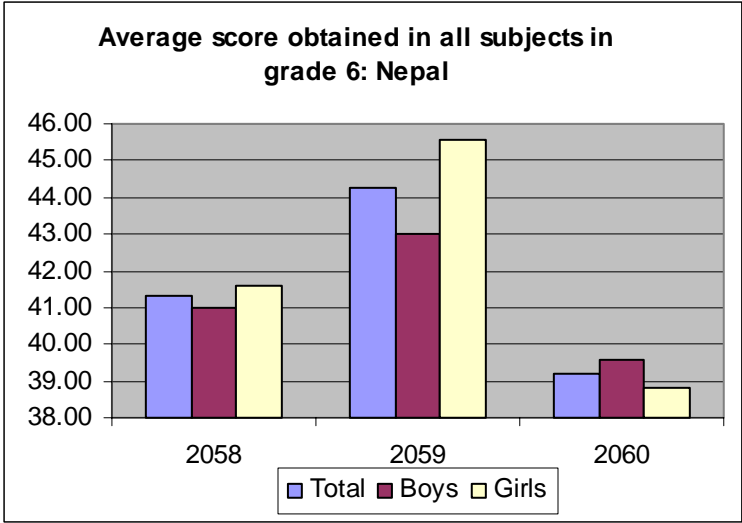
Appendix 9e Gender Gap in the Pass Percentage of Health and Physical Education

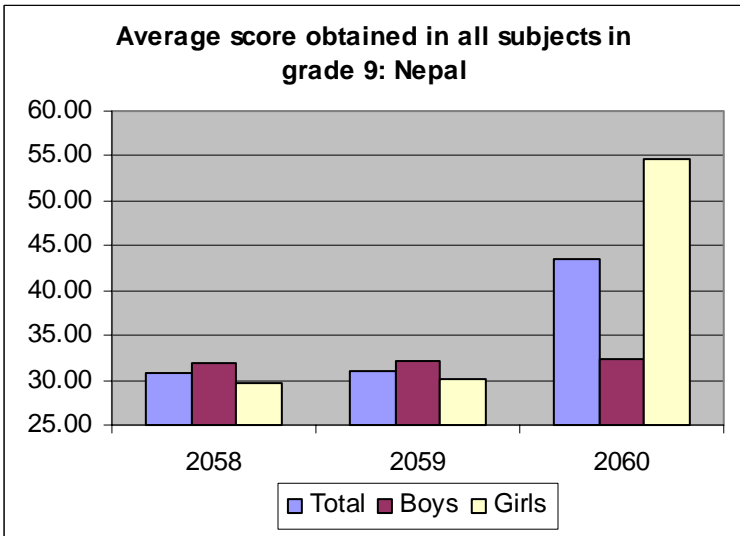
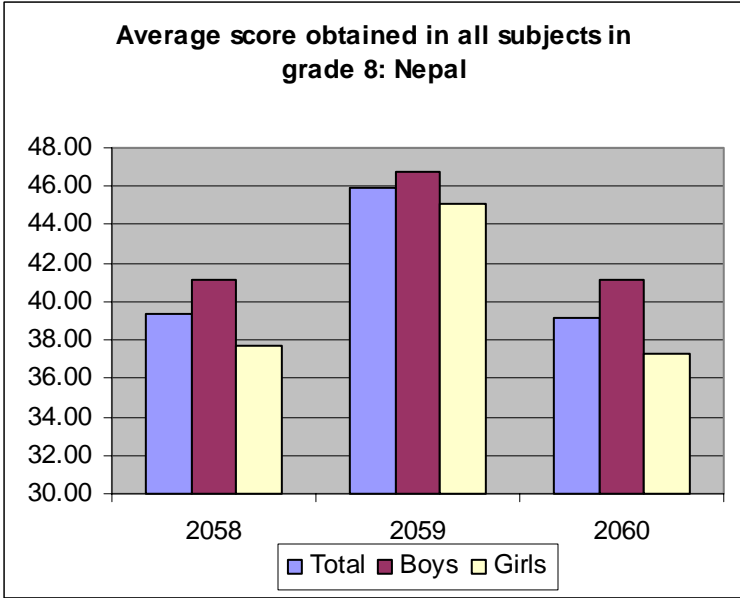
Grade	Year	Physical Education		
		Total	Boys	Girls
4	2058	94.31	93.75	94.87
	2059	88.24	76.47	100
	2060	97.06	94.12	100
5	2058	100	100	100
	2059	100	100	100
	2060	94.89	92	97.78
6	2058	50	0	100
	2059	100	100	100
	2060	100	100	100
7	2058	91.67	100	83.33
	2059	100	100	100
	2060	73.81	66.67	80.95
8	2058	0	0	0
	2059	0	0	0
	2060	79.23	93.75	64.71
9	2058	0	0	0
	2059	0	0	0
	2060	0	0	0
10	2058	0	0	0
	2059	0	0	0
	2060	0	0	0
11	2058	0	0	0
	2059	0	0	0
	2060	0	0	0
12	2058	0	0	0
	2059	0	0	0
	2060	0	0	0

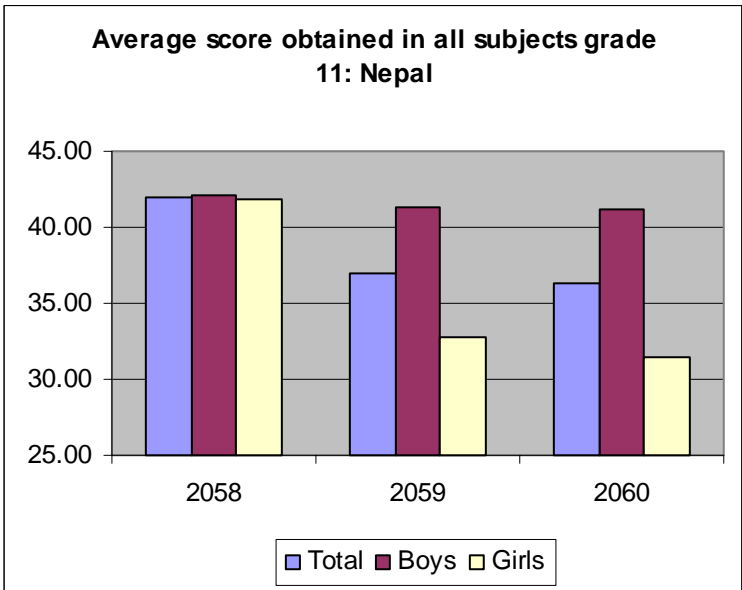
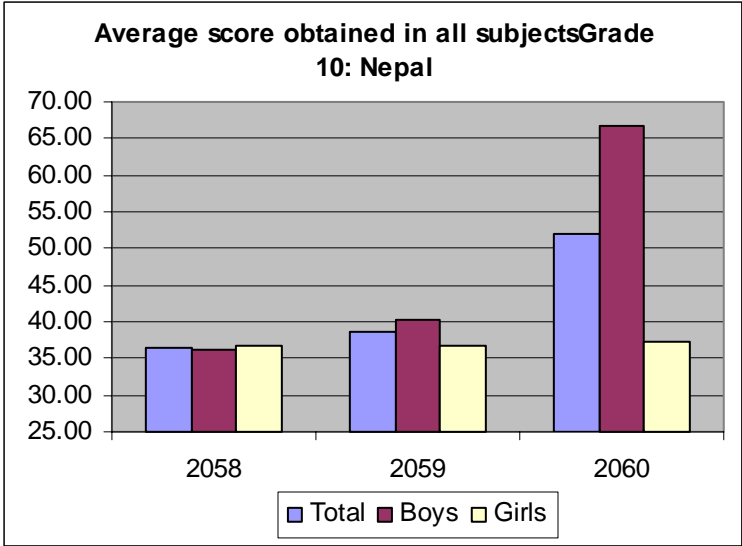
Appendix 10

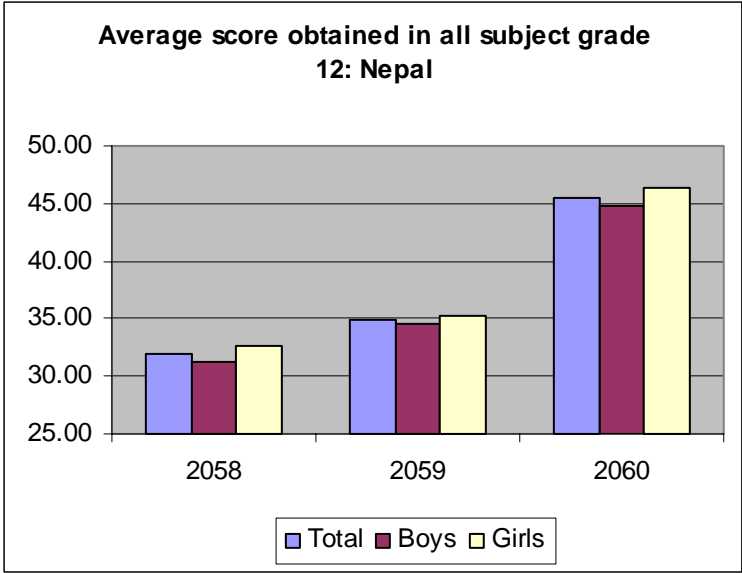
Obtained Scores of the Girls and Boys by Grades (graphical presentation)











List of the Schools Studied	
District	Schools
Panchthar	Shree Siddheswari Secondary School-Bharapa
	Shree Saraswoti Secondary School- Chokmagu
	Shree Sirijung Higher Secondary School-Panchami*
	Shree Phidim Higher Secondary School- Panchami*
	Shree Tharpu Higher Secondary School-Tharpu
Illam	Kafok Higher Secondary School-Panchakanya
	Adarsha Higher Secondary School-Illam MP*
	Boudha Dham Secondary School-Pashupatinagar*
	Fikkal High School-Fikkal
	Shree Purna Smarak Secondary School
Siraha	Jana Higher Secondary School, Golbazar*
	Shree Public Secondary School- Chandralalpur
	Shree Pashupati Adarsh Secondary School
	Little Star Secondary English School
	Chandra Secondary School- Siraha Bazar, Siraha*
Kathmandu Valley	The Rising School - Satdobato, Lalitpur
	Shramjit Kishor Secondary School- Patan M.P, Lalitpur*
	Basu Secondary School Bhaktapur
	Padmodaya Secondary School- Ramsahapath, Kathmandu*
	Viswo Niketan Higher Secondary - Tripuresore, Kathmandu
Rasuwa	Bageshwari Secondary School - Bhorle
	Shree Rasuwa Secondary School - Dhunche*
	Shree Parbati Kunda Secondary School -Goljung
	Shree Kalika Himalaya Higher Secondary - Dhaibung*
	Shree Shyamey Wangphel Secondary School - Shyaphru
Kaski	Kalika Secondary School - Kahun
	Shree Laxmi secondary School - Lekhnath MP*
	Shree Kalika Higher Secondary School - Pokhara MP
	Shree Bharati Bhawan Secondary School - Purano Chour*
	Shree Mahendra High School - Bhalam
Mustang	Janahit Secondary School - Jomsom*
	Janashanti Secondary School - Kagbeni*

	Gyanodaya Secondary School - Letei
	Shree Janabal Secondary School - Marpha
	Yogendra Secondary School - Tukeche
Palpa	Janata Higher Secondary School - Tansen MP
	Shree Gramya Secondary School - Chirtungadh*
	Shree saraswoti Secondary school - Tansen
	Shree Padma Public Higher Secondary - Tansen
	Millenium Higher Secondary School - Tansen
Banke	Narayan High School - Nepalgunj
	Shree Gyanodaya Higher Secondary School- Bageswori
	Sarawati Secondary School-Nepalgunj*
	Mahendra Higher Secondary School - Nepalgunj*
	Modern Public Higher Secondary School - Nepalgunj
Doti	Siddeshwor Secondary School - Banlek
	Dilpeshwar Secondary School - Dipayal Silgadi*
	Radha Krishna Secondary school - Latamandu
	Padma Public Secondary School - Dipayal*
	Pavitra Higher Secondary Boarding School - Dipayal
Kailali	Basudevi Secondary School - Dhangadi
	Aishwarya Vidya Niketen - Dhangadi
	Dhangadi Secondary School - Dhangadi
	Trinagar Secondary School - Dhangadi
	Shree Saraswati Higher Secondary School*

*Schools where the empirical study was undertaken.

Appendix 12

Research Team

Dr. Bidya Nath Koirala: Principal Researcher
Dr. Sushan Acharya: Principal Researcher
Ms. Pushpa Ghimire: Curricular material reviewer
Ms. Sashi Aryal: Research Associate

Mr. Surya Thapa: Field researcher
Mr. Yagya Raj Pant: Field researcher
Mr. Tirtha Raj: Field researcher

Mr. Krishna Prasad Ghimire

Ms. Bina Shakya: Field researcher

Mr. Keshar Jung Magar: Field researcher

Ms. Pallavi Gurung: Field researcher
Mr. Binod Humagai: Field researcher
Mr. Shiva Koirala: Field researcher

Mr. Balram Neupane: Field researcher
Ms. Sarala Manandhar: Field researcher
Mr. Hari Har Nath Regmi: Expert, quantitative data analyst

Appendix 13

Advisory Team Members

Dr. Rukmani Bajracharya, Professor; CERID/Tribhuvan University
Dr. Dinesh Bhujju, Division Chief S & T Promotion RONAST
Dr. Mohan Gyawali, Director, RECAST/ Tribhuvan University
Mr. Ananda Ram Poudel, Gender Focal Person/Ministry of Social Welfare
Ms. Usha Dixit, Gender Focal Person/Ministry of Education and Sports
Ms. Indira Koirala, Gender Expert/Faculty of Science, Trichandra Campus, TU
Ms. Sohae Lee, Education Program Specialist/UNESCO

Appendix 14

Participants of the Workshop Thematic Groups

Thematic groups	Workshop Participants
Socio-cultural reorientation	<ol style="list-style-type: none"> 1. Indira Koirala, Trichandra College: Facilitator 2. Dev Raj Gurung, National Teachers' Association 3. Dr. Kedar Man Shrestha, Central Department of Education 4. Ram Prasad Subedi, Educational Training Center (MOES), Dhulikhel 5. Dr. Sabita Shrestha, Central Department of Chemistry 6. Sagun Basnet, Higher Secondary Education Board 7. Sanat Kumar Sharma, Ministry of Science and Technology 8. Shashi Aryal, Ministry of Education and Sports
Pedagogical reform	<ol style="list-style-type: none"> 1. Prof. Mohan Gyawali, RECAST: Facilitator 2. Dol Prasad Lamichhane, National Teachers' Association 3. Hari Prasad Mainali, Ministry of Women, Children and Social Welfare 4. Indira Thapa, Educational Training Center (MOES), Tripureswor. 5. Jung Bahadur Aryal, Higher Secondary Education Board 6. Nirmala Shrestha, Central Department of Education 7. Palhavi Gurung, National College of Technical Science, Balaju
Girls' encouragement scheme	<ol style="list-style-type: none"> 1. Dr. Sushan Acharya, Central Department of Education: Facilitator 2. Dandapani Sharma, NCED 3. Dr. K. D. Yami, RONAST 4. Lachha K. C., PABSON 5. Mana Bhatta, student TU 6. Dr. Sharada Maharjan, Central Department of Education 7. Uttara Bajracharya, RECAST
School support program	<ol style="list-style-type: none"> 1. Usha Dixit, Ministry of Education and Sports: Facilitator 2. Meenu Pyari Shrestha, RONAST 3. Ram Bahadur Khadka, Ministry of Education and Sports 4. Ram Pyari Shrestha, Department of Education 5. Rita Dhakal, Central Department of Education 6. Dr. Shankar Man Shrestha, Mahendra Ratna Campus Tahachal 7. Dr. Sumon K. Tuladhar, UNICEF Office
Career option for girls	<ol style="list-style-type: none"> 1. Dr Dinesh Bhujju, RONAST: Facilitator 2. Baudha Raj Niraula, Distaance and Open Learning Department 3. Diwakar Awasthi, Department of Education 4. Prof. Govind Sharma Ghimire, Dean, Science and Technology 5. Hari Khadka 6. Keshar Jung Magar, Field researcher/Faculty of Education 7. Sushila Regmi
Revision of curriculum	<ol style="list-style-type: none"> 1. Ananda Ram Poudel, Ministry of Science and Technology, Facilitator 2. Parbati Pudasaini, RONAST 3. Puspa Ghimire, Padma Kanya Campus 4. Ram Badan Pradhan, Women in Science and Technology 5. Ram Chandra Poudel, NCED, Sanothimi 6. Rejina (Maskey) Byanju, CDES, Kirtipur

Note: Sohae Lee, Education Program Specialist/UNESCO, Kristin, Education Programme Assistant, and Dr. Bidya Nath Koirala, Principal Researcher provided necessary inputs to the workshop.



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