CHAPTER I

Introduction

This chapter deals with the background of the study, statements of problems, significance of the study, objectives of the study, research questions, delimitations of the study and definition of the key terms.

Background of the Study

The modern age is scientifically civilized age. Science is exact knowledge which is verified and conformed by various facts. Science is a branch of knowledge involving systematized observations and experiments. It is not only a heap of knowledge but also a way of investigation and it is a process of continuous development and refinement. Science is thus a process as well as product. It is endless process of observation, exploration and acquisition through empirical, conceptual and experimental means.

The word ‘science’ has been derived from the Latin word ‘scientia’ that means knowledge. Science is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and prediction about the universe. According to Aristotle, “Science refers to the body of reliable knowledge itself of the type that can be logically and rationally explained.”

According to Karn Science education is the field concerned with sharing science content and process with individuals not traditionally considered part of the scientific community. The learners may be children, college students, or adults within the general public, the field of science education includes work in science content, science process (the scientific method), some social science, and some

teaching pedagogy. The standards for science education provide expectations for the development of understanding for students through the entire course of their education (Kalra & Gupta, 2012).

Achievement refers to the level of schooling we have successfully completed and the ability to attain success in our studies. When we receive great grades, this is an example of academic achievement. When we attend college and graduate school, this is an example of academic achievement. Achievement is that output of teaching learning process which is obtained after the completion of programmed. Achievement of students is the most important thing in learning, learning styles and teaching learning process of students. Here, the term achievement means, the scores obtained by students on the test. The distinction of the individuality of students can be illustrated by the diversity of their test scores. When many students begin school, their test scores are comparable but their experience is varied. Achievement test is a kind of standardized test which can be used to assess and evaluate the performance of the students. Thus it is administrated to measure level of knowledge comprehension, skills and attitude gained by students.

The term engagement is defined as total activity of students that are support their learning such activities includes who is attending class, interacting with teacher in the classroom, interacting with peers, do homework and class work, questioning and team work and so on. Therefore the researcher become interested in correlate between achievement and engagement of girls student of secondary public school. Science is a technical subject which needs more time to practice and high attention to learn but by nature such qualities are found in very few girls. In context of our country, girls are not encouraged for study by their parents and society. Less number of girls chance to involve in science education comparatively.

In Nepal, men tend to be the owners of property and decision makers in the families. Women often stay at home, cleaning, cooking and caring for their children. Although these activities are essential for the well-being of the family, women are often not respected for their work. Many times, when women venture out of the home to take part in other types of activities such as going to school, owing business and participating in politics, they are often held back or discouraged. The participation of women is very low in economics, intellectual, social and political opportunity in the society.

The status of women in Nepal remains very poor in terms of health, education, income, decision-making, and access to policymaking. Patriarchal practices, which control women's lives, are reinforced by the legal system. Women face systematic discrimination, particularly in rural areas. Literacy rates are substantially lower than men's, and women work longer hours. Violence against women is still common, and there are not enough women in professions. Women's representation has been ensured in constituent assembly, but women's equal participation in all state mechanisms is far from ideal.

The constitutional provision setting aside 33% representation of women in Nepal's all state machineries is a major breakthrough. Clause 6 of the Article says that the both spouses shall have rights in property and family affairs.

As a reply to many jurists, who frown upon Nepal's Constitution without examination, reading article 38, which envisages right of women as a Fundamental Right is crucial. The clause 1 of the Article says that every woman shall have equal rights to lineage without any gender discriminations. However, for ensuring the same rights, India has to travel 55 years from the 1950, the enforcement year of Indian constitution.

Further she maintains the clause 3 of A-38 also ensures that the state would punish every kind of psychological violence against women, which in itself serves a broader spectrum. It also talks about right to compensation, positive discrimination, principles of proportional representation to mainstream the women, and rights relating to safe motherhood. So there is no need to be pessimistic, without any iota of doubt Nepal would become a paradise for women and developmental agendas for women will flourish beyond word provided the state realizes the dream of Article 38.

The Indian constitution has enshrined gender equality through female right directive principle of state policy and adopts measures of positive discrimination in favour of women. The Articles 14, 15, 15(3), 16, 39 (a), 39 (b), 39 (c), 42 & 243 are of specific importance in this regard to ensure no discrimination to women on any ground.

It is the citizenship provision that the Nepali women have put forward a dissenting opinion against. Saying that the citizenship provisions have made them 'dependent citizen', an amendment has been sought. It provisions that no woman will be allowed to confer citizenship onto their children.

One of the issue in Nepal's education system is female education. This issue has been neglected since the 1950s. In fact, there is an extreme inequality in the literacy rate between men and women. In Nepal, 71 percent of men are literacy whereas the literacy percent of women is only 44 percent (Giri, 2016). Another issue in relation to women's education is that parents do not have enough money to ensure their children have access to education. A large proportion of women do not get access to scientific and technical education that can help modernize their professions and increase their productive output. Despite these constraints, women with basic scientific and technical education are increasing over the years. These groups have

entered technical carriers such as teachers, engineers, doctors, pilots and others. At school, almost two-thirds of the girls drop out and this dropout and class repetition increases with grade increases despite the increase in female teachers. Nevertheless, female participation in schools is progressively increasing (Adhikari, 2013).

The SLC was first introduced in 1990 B.S. in Nepal. Thirty-three male and only one female participated in the first SLC examination. Education policy 2028 B.S. gave different education programs for the women such as primary teacher training for eight class passed female student in 2044 B.S., provision for women scholarship, school dress and informal education in 2049 B.S., Female Education Department was established for provision of women scholarship, development of quality education, minimum one female teacher in every primary school, monitoring of the program, publicity program for female education etc. were made. There are different activities and policies adopted for the development of female education in Nepal these days.

The literacy rate of women varies in rural and urban areas of Nepal. The rural literacy rate of female is 36.5 percent and the urban rate is 61.5 percent. The low rate of female education is due to many reasons. First, women are treated as second class citizens in the society and they are supposed to be home keepers. Their main duties are to serve home and male members in the family. So their achievement in any field of education is very low. (Mahato, 2016)

Secondary education takes place in 2 stages. Grades 9 to 10 follow a common academic curriculum leading to a School Examination Exam. During grades 11 to 12 though, there are opportunities to follow separate streams in commerce, education, humanities or science, and to receive a higher education certificate. Science as a subject in school was introduced late in 1930’s as optional subject until 1961. From 1961-1971 science was compulsory for boys but optional for girls. In 1971, school

science was made compulsory subject for both boys and girls. In 1981, secondary school curriculum was revised and science combined with health. In 1984, science was made as optional subject again. In 1992, finally science was made compulsory subject at secondary level (Shrestha, 2009).

From 1992-2016, the secondary school science curriculum was included four prominent areas such as Physics (40%), chemistry (20%), Biology (30%) and Astronomy and Geology (10%). Secondary school's science subject in SLC examination carries 100 marks, out of which 75 marks is allocated for theory and 25 marks for practical. After revision and improvement of secondary level curriculum in 2017, the secondary school science curriculum includes four prominent areas such as Physics (30%), chemistry (30%), Biology (30%) and Astronomy and Geology ((10%). Secondary school's science subject in SLC examination carries 100 marks, out of which 75 marks is allocated for theory and 25 marks for practical. In 2016, grading system is in practice instead of marking system in SLC examination. After one year of beginning of grading system, the SLC examination is replace by SEE examination in 2017. The science learning encourages questioning, examining, and exploring evidence based on knowledge. The main objective of teaching science at secondary school is to develop basic knowledge of scientific concepts, principles and laws, impart the skills of observation and inquiry and develop competencies in applying knowledge and skills in solving problems of our daily life. (Education system Nepal, 2014).

At present, the school system in Nepal has become decentralized, giving more control to the schools and communities rather than the government, allowing schools to cater better to local needs. Schools that are a part of this decentralized system are called Community Schools. These are managed by School Management Committees

(SMCs) which are made up of members of the local community, working closely with the Head-teacher and local government officials to improve educational quality and raise funds for the upkeep and development of the school and teachers. Gender differences with regard to academic performance remain one of the more challenging issues in educational research. Gender disparity in education has traditionally focus on the under participation of girls and still is in some parts of the world. In a number of countries, including Nepal, gender disparity in basic and higher education are in favour of girls both in terms of engagement and achievement (Bista, 2004).

In our society, cultural restrictions foe the education of women confine them to the domestic and limit their engagement in educational activities. The low rate of girl's engagement in science education have long term effect on the field of education. It causes low achievement of girl's in science. So it is necessary to identify correlation between achievement and engagement of girls in the field of education as well as science education. Therefore, it was very important to undertake a research on this topic.

Statement of the Problem

Government spends huge amount of budget and resources on government school but achievement of students in science is low as shown by SEE result. Numerous researches have been tried to identify the variables that influence the achievement of students in science but these study is not addressed correlation between engagement and achievement of girl students in science in secondary level of public school. The engagement in classroom activities is a main factors of achievement of students in science. Engagement (or lack of engagement) is often a key predictor for early warning signals of student achievement and performance.

Regular participation in classroom activity is an important factor in a student's success at school.

Gender differences with regard to academic performance remain one of the more challenging issues in educational research. Gender disparity in education has traditionally focus on the under engagement of girls and still is in some parts of the world. In a number of countries, including Nepal, gender disparity in basic and higher education are in favor of girls both in terms of engagement and achievement.

There are different variable that affect achievement of girl's in science in Nepal as well as Sindhupalchok district. The main problem of this study is identify the correlation between engagement and achievement of girl students in science in secondary level of public school

Lower achievement and engagement of girls in science education is reflection of their position in society, poverty, social aspects and school related factors. Participation of girl's in science and all of field of technology is extremely low. Therefore this study entitled, "Correlation between engagement and achievement of girl students' of public school in Sindhupalchok district" has been prepared to identify the correlation between achievement and engagement of girl students of public school in the study area and recommend to increase achievement in girl students in science in secondary level.

Significance of the Study

Science is an important component and subject of school curriculum. Everybody needs the basic knowledge of science to adjustment in his/her life. The development of school science curriculum, textbooks and policy on school education should be done based on identification of students' achievement. This study therefore

aims at assessing students' general achievement in science at secondary level public school.

In Nepal, there are some educational institutions where the number of girl students are high. For making educational plan in this type of educational institutions, the present status of girls is important. For the different types of scholarship projects and for the participation of girls in different activities, the correlation between engagement and achievement of girl students is essential. The information of correlation between engagement and achievement of girl students in science may become a base to develop a suitable science curriculum in future.

This study will provide information to both teachers and parents about correlation between engagement and achievement in science of girl students. This study will help the teacher to improve teaching environment while teaching the different gender. This study will inform the government, other concerned authorities, policy makers and planners of education about the correlation between engagement and achievement of girl students in science. This study will help to promote the academic quantities or GPA of girl students. This study will help the school administrator and member of SMC to run and manage their school system smoothly. This study may enhance the level of engagement in science learning with remedial measure. This study may reduce the sexual effects of students in science learning. This study may help to compare learning achievement of boys and girl students'. It may also help to the other researcher who wants to research with this related topic. This study will help the science teacher, science subject export, science curriculum designer, research persons for different purpose such as to improve professional skill, to make rules, to increase participation of students, to improve achievement of the students, to change and improve teaching learning styles etc.

Objectives of the Study

The objectives of the study was following:

- To explore the girls meaningful engagement in school science at secondary level.
- To compare the achievement of girl students in school science with boy students.
- To find the correlation between meaningful engagement and achievement of girl students in school science.
- To find out the factors affecting of girls engagement in classroom.

Research Questions

The study mainly concerned with to the correlation between engagement and achievement of girl students' in science of public school in secondary level. Therefore, this study aims to answer the following research questions.

1. How will girl students engage in science classroom at secondary level?
2. What is the achievement of girl students of public school in secondary science?
3. What are the possible factors affecting girls' engagement in secondary science?
4. What classroom engagement correlated with achievements of girl students' of public school in secondary science?

Delimitation of the Study

Each study is not rigorous, perfect and free from limitation. All studies have some limitation and on the other hand they can overcome the problems of every field. This study also has some limitation. This study will delimited to Sindhupalchok district. This study will focus on Correlation between engagement and achievement of girl students only. This study will be delimited on the randomly selected two public secondary school of Sindhupalchok district. This study will be delimited on the girl students of class 9 only. The primary data of the study will be collected by using different types of question items.

Definition of Terms

Every study has a particular meaning of different words, the key terms used in this research are as follows.

Correlation: Correlation is a statistical tool that can used to test relationships between two or more quantitative variables. That is participation and achievement of students' for this research.

Correlation coefficient: Correlation coefficient is the degree of relationship between two or more variables.

Achievement: The scores obtained by the grade 9 and 10 students on the test conducted by the researcher.

Engagement: The term engagement is defined as attending class regularly, interacting with teacher in classroom, interacting with peers, doing homework and class work in the classroom.

Secondary school: Those school which includes grade 9 and 10 in formal education.

Public school: The school established, managed and financed by government of Nepal, Ministry of Education.

CHAPTER – II

Review of the Related Literature

Literature review is a scholarly works such as thesis, research report, article etc. Literature review should provide a context for the research, justify the research, ensure the research hasn't been done before, show where the research fits into the existing body of the knowledge, enables the research to learn from previous theory on the subject, illustrate how the subject has been studied previously, outline the gap in our previous research, show that the work is adding to the understanding and knowledge of the fields, help refine, refocus or even change the topic, identify the different methodologies, show the relation and help us to provide the contemporary issue. The main purpose of review of related literature is to develop some temperature in one's area to see what new contribution can make and receive some idea for developing a research design.

This chapter attempts to review the research studies related to this study. There are several studies undertaken towards the correlation between engagement and achievement of students in science and other subjects. But there is no study has been performed till which are directly related to the correlation between engagement and achievement of girl students in science at secondary level of public school in the context of Sindupalchok district of Nepal. However, this session we ensure about theoretical literature, empirical literature and conceptual framework.

Theoretical Literature

Theories are formulated to explain, predict and understand phenomena in many cases, to challenge and extent existing knowledge within the limits of critical boundary assumptions. The theoretical framework is the structure that can hold or

support a theory of a research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists.

Achievement Goal Theory

Achievement goals are competence-based aims that individuals target in evaluative settings. Originally, two distinctive achievement goals were identified based on the definition of personal competence: task and ego goals (Nicholls 1984; Nicholls 1989) or, in other words, mastery and performance goals (Dweck 1986; Dweck & Leggett 1988).

Specifically, task (mastery) goals reflect perceived competence in terms of absolute evaluative standards or task mastery. When someone is task-involved, her primary goal is learning and mastery of the task for its own sake. Task involvement appears when the athlete is intrinsically interested in the activity and judges herself in a self-referenced manner. Therefore, task oriented goals rely on comparisons with requirements of the task and/or internal comparisons with one's past attainment or one's maximum potential attainment. There is a focus on effort and improvement. Ego or performance goals reflect competence perception relative to the performance of others. Therefore, ego oriented athletes define their competence in terms of interpersonal and normative comparisons. These two goal orientations determine different consequences in achievement context. In general, task orientation is regarded as more adaptive than ego orientation. Task orientation is related to selection of challenging tasks, effective study strategies, positive attitudes toward learning, and positive emotions, whereas quite often ego orientation is associated with selection of easier tasks, trivial learning strategies, concern for social status, and thoughts of escape and behavioural withdrawal when difficulties are encountered (Dweck &

Leggett 1988; Biddle, Wang, & Kavussanu, 2003; Kaplan & Maehr 2007; Bortoli, Bertollo, Comani, & Robazza, 2011).

Participatory Learning Approach

The Participatory Learning Approach engages students as active participants in the full life cycle of homework, projects and examination. PLA's core idea is that students design the questions or projects, execute them, and then assess and grade their peers' solutions. Each stage can be performed by individuals or by teams. Students should be able to observe or read everything their peers do so they can learn further from others' efforts. PLA is designed to work for a wide range of students from junior high graduate and professional schools, as well as for training and adult learning. Many instructors have tried various pieces of the PLA technique on their own and individual aspects have been studied more rigorously. For example, many instructors have students generate questions and sometimes answers as a study tool or to foster class discussion. Others have students' grade peers' projects, either sharing them on-line or after a class presentation. This occurs at the college and secondary school level. Furthermore, inquiry focused approaches and problem-based learning in which students develop problems and investigation strategies, are often used in secondary school classrooms. (Hersam et al. 2004, Reynolds 2004, Richards et al. 2004, Wiswall & Srogi 1995)

Nobody, however, has systematized the PLA across the entire problem life cycle, developed the supporting tools and documentation ensuring ease of use on a large scale, or scientifically evaluated its effect on learning, either at the secondary school or college level. PLA helps different learning activities such as to increase learning of course materials primarily and assessment skills secondarily, to provide and evaluate a systematic, collaborative approach to homework assignments, projects

and examinations, focusing on active participation and peer evaluation, to ensure this approach supports pedagogy effectively across different genders, to minimize additional overhead and whenever possible save the instructor time (Shen, 2004).

Women Empowerment Theory

Women education, which is somehow linked to empowerment of women. It is a topic of high importance in the recent times for the overall development of the country. Entire nation, business, communities and groups can benefit from implementation of programs and policies that adopt the notion of women empowerment.

Empowerment of women is one of the major procedural concerns while addressing human rights and development. Approach, Millennium Development goals and other credible approaches aim at the point to empowerment and participation of women to the overall development of women (Sodhi, 2012). Similarly, empower refers to gaining a recovering one's own power or giving power to someone else. Empowerment in any sense that really matters must result in a substantive transfer of resources.

Empowerment is not giving people power, people already have plenty of power in the wealth of their knowledge and motivation and to do their jobs magnificently. Empowerment is necessarily linked with participation. Once they participate, they obtain the skill and knowledge that will allow them to overcome from obstacles in their life or create working environment and ultimately, help them to develop within themselves as well as in the society. (Blanchard, 1996 as cited in Devkota 2017)

The status of women in Nepal has varied throughout history. In the early 1990s, like in some other Asian countries, women in Nepal were generally subordinate to men in virtually every aspect of life. Historically, Nepal has predominantly been a patriarchal society where women are generally subordinate to men in virtually every aspect of life. Men were considered to be the leader of the family and superior than women while the social norms and values at that time were also biased in favour of men. This strong bias in favour of sons in society meant that daughters were discriminated against from birth and didn't have equal opportunities to achieve all aspects of development (Bhattarai, 2014). The report further states that “the impact of women’s education on the nutritional status, life expectancy and general welfare of children is already well documented”. Now after acknowledging this report we can say that women education is important as it has far reaching results, first it makes women empowered and effects on quality of a whole family.

Empowerment also means involving in the growth process and changes that is never ending and self-initiated, increasing one’s positive self-image and overcoming stigma and increasing one’s ability in discreet thinking to sort out right and wrong. Participation in different activities empower women. When they participate in various activities they become active and it contributes in changing their way of thinking. It also promotes women to be familiar with new technologies.

Feminist Theory

Feminist theory is a major branch of theory within sociology that shifts its assumptions, analytic lens, and topical focus away from the male viewpoint and experience and toward that of women. In doing so, feminist theory shines a light on social problems, trends, and issues that are otherwise overlooked or misidentified by the historically dominant male perspective within social theory. Key areas of focus

within feminist theory include discrimination and exclusion on the basis of sex and gender, objectification, structural and economic inequality, power and oppression and gender roles and stereotypes among others. Many people incorrectly believe that feminist theory focuses exclusively on girls and women and that it has an inherent goal of promoting the superiority of women over men. In reality, feminist theory has always been about viewing the social world in a way that illuminates the forces that create and support inequality, oppression, and injustice and in doing so, promotes the pursuit of equality and justice.

That said, since the experiences and perspectives of women and girls were historically excluded from social theory and social science, much feminist theory has focused on their interactions and experiences within society in order to ensure that half the world's population is not left out of how we see and understand social forces, relations, and problems. While most feminist theorists throughout history have been women, today people of all genders can be found working in the discipline. By shifting the focus of social theory away from the perspectives and experiences of men, feminist theorists have created social theories that are more inclusive and creative than those which assume the social actor to always be a man. Part of what makes feminist theory creative and inclusive is that it often considers how systems of power and oppression interact, which is to say it does not just focus on gendered power and oppression, but on how it might intersect with systemic racism, a hierarchical class system, sexuality, nationality, and disability, among other things(Crossman, 2018)

Empirical Literature

The empirical study of literature is an interdisciplinary field of research which include the psychology, sociology, philosophy, history of reading literary texts. Empirical research is based on observed and measured phenomena and derives

knowledge from actual experience rather than from theory or belief. However, studies related to this topic are briefly cited as given below.

Karki (2011) did a research on the topic “Factors causing low achievement in mathematics at secondary level” with three objective to determine the correlation between causing factors and mathematics achievement at ineffective school of Surkhet district. For this research researcher has been selected 20 students from each school ineffective and effective by taking interview schedule and observation form to find out factors of low participation. The researcher found the factors are gender, motivation, personal factors, attendance and study time at home. The researcher has used to description method to describe factors of low participation.

According to Thapa (2011) conducted on the topic “participation and achievement of Dalit students on lower secondary level”. The researcher was used descriptive case study in nature followed by both quantitative and qualitative approach. He used questionnaire, observation and interview tools to collect data. The researcher used percentage and mean in data analysis procedure. The measure findings of the study was normal which was not satisfactory and the achievement level of Dalit students in lower secondary level was also normal which was not satisfactory.

Rawat (2015) did a study on the topic, “participation of girls at higher secondary level mathematics in Surkhet district”. Objectives of the study was that to explore the participation of girls in learning at higher level mathematics and to examine the influencing factors of less participation of girls in the learning mathematics in higher secondary level. The design of the study was qualitative with case study approach. Data collection tools were selected that one set of questionnaire, one set of interview and one set of observation and the major findings of the study

was the participation of girl students in higher level mathematics education at Surkhet district is very low. Society as a whole believed that female is mathematical less capable than male.

Yadav, (2011) carried a research entitle. “A comparative study of the secondary level students’ achievement in science at public schools and private schools at Siraha district.” He found that the difference between two mean scores of boy and girl students in science at secondary level is significant at 0.05 levels. But there is no significant difference between the achievement of boy and girl students’ in science at the lowest scorer private school.

Report on Gender Experience in Public Schools of Nepal (CERID, 2004) the economic condition has been one of the factor in keeping girls away from school. Due to limited financial resources, most of parents give priority to boys and the meaning of "equality" thus has been ignored. Report concludes that providing education means helping to acquire economic independence. But only economic independence is not enough. The principal necessity is gender awareness. Until and unless people are gender-aware, no program for girls and women can be expected to succeed. Gender issues are looked from positive and negative sides. Gender discrimination is based on socio-cultural practices. The gender issues are prevalent both in developing and developed countries, it is important to learn from each other to deal gender issues at different levels. (CERED, 2004:76).

CERID (1981), published report entitled factor affecting science teaching/learning at secondary school in Nepal show that private school have better academic environment, well managed office apace and equipment. The facilities of public school have better school management, lab facilities, garden, library etc.

Classroom discipline was better in private school. Most of the private school use English as a medium and public school used Napoli medium.

Aryal (2014) conducted the study on the topic “participation of Muslim girl students in mathematics learning”. The researcher used survey method authenticated by quantitative approach. She used observation schedule, questionnaire and interview schedule to collect data. She selected sample school with multistage stratified random sampling. The major findings was that teachers were not careful about students’ class regularity and they were not trained in supportive to Muslim culture. So Muslim students’ did not take interest in learning mathematics. Also the school aspects like physical facilities, gender bios at school and teacher’s and peer’s behavior towards Muslim girl students affected the Muslim participation in mathematics learning was low and not satisfactory.

Pant (2002) has conducted her study on the topic, “A study of achievement and participation of female in bachelor level mathematics education”. The main objectives of the study were to compare the mathematics achievement of male and female students in B.Ed. level and to find out the factor affecting participation of female in mathematics learning in B.Ed. level. For the data collection, the researcher developed a form of table and set of questionnaire. For the collection of data, the researcher visited sampled campuses which by random sampling. The conclusions of the study were:

There is no difference in mathematical achievement in higher education by gender. Social factor such as discrimination behavior, economic condition, lack of time for hard labor are responsible for making lower participation of female in the study of mathematics

From the above different research it concluded that there was a close relationship between participation and achievement of girl students. Which girl students' participation level is low achievement of that students' also low and not satisfactory.

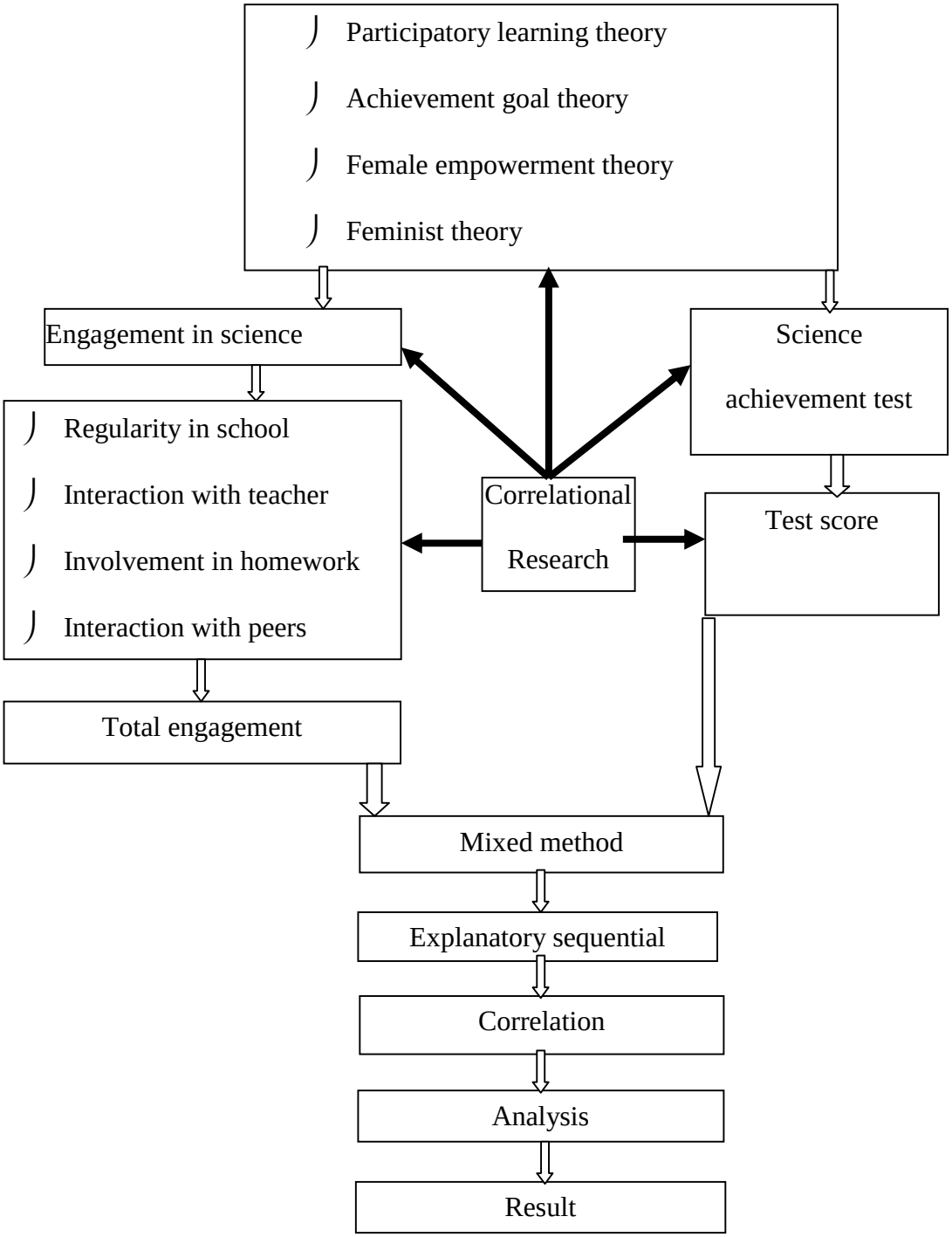
Conceptual Framework

Conceptual framework is a mental map. A conceptual framework can be either graphic or narrative, or a combination of the two. A conceptual framework in graphic form might include graphs, charts, illustrations or even videos summarizing previous research and theories. Graphic frameworks are easier to scan for key points, which can serve as a helpful reference for you throughout your own research. A narrative framework is more common, but the text can be quite dense and difficult to navigate. Adding plenty of bullet points, bold and italicized text, charts and figures can make it easier to skim the text and pick out the relevant data on future consultations (thefreedictionary.com).

From the discussion of literature it is concluded that the correlation between engagement and achievement of girl students' in science of public school in secondary level was included that doing homework, doing classwork, attending class, interaction with teacher and students, questioning and teamwork. Also it was included those pedagogical aspects, home aspects, school aspects, students' attitude towards science and social aspects. It was also concluded that interest of learner, expectation, views of believe, physical facilities, gender bias, teacher and peers behavior, social system, culture customs and traditional effects of gender in society.

The conceptual frame of this study can be diagrammatically represented as below.

***Figure 1*: Conceptual Frame of Study**



CHAPTER – III

Methods and Procedure of the Study

Methodology of the Study

Research methods and procedure are the scientific process, which determine how the research complete and systematic. A research method is a systematic plan for conducting research.

Sociologists draw on a variety of both qualitative and quantitative research methods, including experiments, survey research, participant observation, and secondary data. Quantitative methods aim to classify features, count them, and create statistical models to test hypotheses and explain observations. Qualitative methods aim for a complete, detailed description of observations, including the context of events and circumstances.

This research was related on the topic of “Girls Engagement and Their Achievement in Science in Sindhupalchok District: A Correlation Study”. The methodology of this study included the research design**,** population and sample of the study, data collection tools, data collection procedure and data analysis and interpretation.

Research Design

The research design is a logical and systematic planning and direction of research. Simply, research design is an overall plan of scheme. This design of the study was descriptive and statistical analysis research design. This research was based on the both quantitative and qualitative approach or mixed method under explanatory sequential design.

Population and Sample of the Study

According to recorded available from the DEO Sindhupalchok, there are 147 Secondary schools at Sindhupalchok district. Out of them 136 are public and 11 are private secondary schools. There are all 136 public secondary schools having girl students.

All the students of the grade nine of public school in Sindhupalchok district were taken as the population of the study. The students of the class nine of two public schools Shree Sharada Secondary School and Shree Balshiksha Secondary School in class 9 of academic year 2076 B.S. of Sindhupalchok district were selected as sample of study. The main purpose of selecting these schools were to make comprehensive sample of the population covering all the public schools. Two science teachers, one from each school and two student's one from each school were also taken for the interview to analyze the correlation between engagement and achievement of girl students'.

Study Area

The study was carried out at Sindhupalchok district. Mainly two public schools were selected for the study and data collection.

Sindhupalchok district is a part of province No. 3 and one of the seventy-five districts of Nepal. It lies in Bagmati Zone in the central region of Nepal. The total area of the district is 2,542 sq km. The district is surrounded by Nuwakot, Kathmandu, Kavre, Rasuwa, Dolakha and China. Sindhupalchok just 85km. away to the north-east of Kathmandu valley and situating in the lap of Jugal Himalayan Range, Sindhupalchok district is one of the biggest district among eight districts of Bagmati Zone of Central Development Region.

Most of the girl students at secondary level do not like science subject due to the possibility of failure in examination. Girl's dislike to this subject has become a greet problem to educationalist and stakeholders. There is now an equity theory that both male and female should have chance of getting education as social importance. When girls are distracted from science, it is conform that women could not get the position of scientist. The students in general and girl students in particular have negative attitude towards this subject but the factors that are responsible for creating negative.

Data Collection Tools and Techniques

For this study, the data collection tools were two sets of Likert's Scale in which one for the teachers and another for the students, two sets of interview papers in which one for the teachers and another for the students and forty multiple choice items for class nine constructed based on the specification grid. The test items were developed from all areas of science such as physics, Chemistry, Biology, Geology and Astronomy. The number of items from these areas were according to the specification grid.

Table 1: ***Number of Test Items from Different Branches of Science according to Specification Grid***

S.N.	**Science area**	**No. of test items**
1.	Physics	12(30%)
2.	Chemistry	12(30%)
3.	Biology	12(30%)
4.	Astronomy and Geology	4(10%)
	Total	40(100%)

The test items included multiple-choice objective items having four options of which only one option was correct answer. In qualitative analysis, it will represents the personal feelings and experiences which presents in sentences in the process of data analysis then researcher was classified and tabulated data. It will collected from structured questionnaire and interview.

Validation of Tools

Firstly I made tools for collect data and validate it by Professor, research guide, experts and University lectures. The tools and also the way of analysis was revised on the basis of feedback, comments and suggestions from them. Then the research was taken in two public schools Shree Sharada Secondary School and Shree Balshiksha Secondary School in class 9 of academic year 2076 B.S. of Sindhupalchok district for data collection.

Data Collection Procedure

At first, the researcher was visited the purposively selected schools, then requesting and briefing to respective head teacher and requested the respective school authority for co-operation to conduct an achievement test about research work. I was also said reason to reach school for fulfillment of own purpose. Then the researcher was collected data from science teachers and students of class nine for engagement, achievement and factors affecting of the girl students by Likert's scale, questionnaire and interview.

An orientation was given to the students before conducting the test and collect primary data. The test was administrated to the all students of class 9 with the help of head teacher and school science teacher of respective school. After administrating the

test, all the answer was collected and scored. One score was given to each correct answer. The items without any answers was not scored.

After tabulating the information from the questionnaire schedule the researcher analyzed at glance with statistical device percentage and mean then further analysis the data by using excel. Finally the researcher analyzed explicitly.

CHAPTER IV

Analysis and Interpretation

This chapter deals with the analysis and interpretation of the data obtained from the study. The main objectives of this study was to identify engagement of girl students in science and correlated between engagement and achievement of girl students in science. The research was conducted at Shree Sharad**a** Secondary School and Shree Bal Shiksha Secondary School in Sindhupalchok district. The main tools asked from this study were observation form, interview paper, achievement test paper and published and unpublished school documents. The collected data were analyzed and interpreted by using the formula developed by Pearson to find out the extent of correlation coefficient.

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,][\,n\Sigma y^2 - (\Sigma y)^2\,]}}$$

Where,

r = Pearson correlation coefficient

n = number of students

x = marks obtained by students from achievement test

Y = engagement position

The value of Pearson's correlation coefficient always varies between ±1, where +1 indicates perfect positive correlation. A change in the value of one variable will predict a change in the same direction in the second variable. And -1 indicates perfect negative correlation between two variables. Other value of correlation between ±1

shows different degree of correlation. A change in the value of one variable predicts a change in the opposite direction in the second variable.

Connolly and Sluckin give useful guide to the degree of relationship indicated by the size of the coefficient which provides a useful guideline to find out how positively or negatively two sets of score related. He defined the coefficient of correlation as follows.

Table 2: ***Correlations Values and Description***

Coefficient of correlation		Description
0.90-1.00	Very high correlation	Very strong relationship
0.70-0.90	High correlation	Mark relationship
0.40-0.70	Moderate correlation	Substantial relationship
0.20-0.40	Low correlation	Definite relationship but a small one
0.20 and less	Slight correlation	Relationship so small as to be negligible

Analysis of Girls Meaningful Engagement in School Science

One of the objectives of the study was to explore the girls' meaningful engagement in school science at secondary level. The data obtained from the study are presented in terms of following topics.

Analysis of Students' Class Attendance According to School Record

The number of school opening days and students' attendance days under grade XI (Baishakh-8 to Jeth-31) of 2076 from the school record are presented in the following table.

Table 3: ***Class Attendance of Girl Students of Grade IX in 2076(Baishakh-8 to Jeth-31)***

Range	Number of students in attendance	Percentage
90-100	12	60%
80-90	6	30%
70-80	2	10%
60-70		
50-60		
40-50		
30-40		
20-30		
0-20		

Where, Outstanding (4.0): (90-100) %, Excellent (3.6): (80-90) %, Very good (3.2): (70-80) %, Good (2.8): (60-70) %, Satisfactory (2.4): (50-60) %, Acceptable(2): (40-50) %, Partially Acceptable (1.6): (30-40) %, Insufficient (1.2): (20-30) %, Very Insufficient (0.8): (0-20) %.

The finding recorded in table 3 shows that out of 46 school opening days of grade XI (Baishakh-8 to Jeth-31) of Shree Sharada Secondary School and Shree Balshiksha Secondary School the attendance days of girl students and their percentage are as follows. Twelve girl students have (90-100), six girl students have (80-90 and two girl students have (70-90) under range.

From the above table found that 60 % of girl students have (90-100) which is outstanding, 30 % of girl students have (80-90), which is excellent and 10 % of girl students have (70-80) which is very good. Then nobody of girl students attend below the range 70.

Girls' participation in Classroom Interaction

Twenty selected girl students classroom interaction level with teacher and their friends are presented in the following table which is obtained from the students class observation form within five days. The interaction position with teacher and peers denoted by 100% for five days, 80% for four days, 60% for three days, 40% for two days and 20% for one day is obtained in their class observation.

Table 4: ***Interaction Position of Girl Students***

Range	Number of students in interaction with teacher	Percentage	Number of students in interaction with peers	percentage	Average interaction	Percentage
90-100	1	5%			1	5%
80-90	6	30%	3	15%	2	10%
70-80					3	15%
60-70	7	35%	12	60%	5	25%
50-60					8	40%
40-50	6	30%	5	25%	1	5%
30-40						
20-30						
0-20						

Where, Outstanding (4.0): (90-100) %, Excellent (3.6): (80-90) %, Very good (3.2): (70-80) %, Good (2.8): (60-70) %, Satisfactory (2.4): (50-60) %, Acceptable(2): (40-50) %, Partially Acceptable (1.6): (30-40) %, Insufficient (1.2): (20-30) %, Very Insufficient (0.8): (0-20) %.

The finding recorded in table 4 showed that interaction level of girl students with teacher, peers and their average level were given. One girl student has (90-100) %, six girl students have (80-90) %, seven girl students have (60-70) %, and six girl students have (40-50) %, in interaction position with teacher. Likewise three girl

students have (80-90) %, twelve girl students' have (60-70) % and five girl students have (40-50) % in interaction position with peers. Then one girl student has (90-100) %, two girl students have (80-90) %, three girl students have (70-80) %, five girl students have (60-70) %, eight girl students' have (50-60) %, and one girl student has (40-50) %, in average interaction.

From the above table found that 5% of girl student has (90-100) %, which is outstanding, 10% of girl students have (80-90) % which is excellent, 15% of girl students have (70-80) % which is very good, 25% of students have (60-70) %, which is good, 40% of girl students have (50-60) %, which is satisfactory and 5% of girl students have (40-50) %, which is acceptable. Then nobody of girl students interacted below the 30% in average between teacher and peers. The result of table 4 showed that interaction level of 95% students have above satisfactory and 5% students have below satisfactory.

Girls Participation in Extra Activities (HW and CW)

Twenty selected girl students' engagement level in extra activities (HW and CW) are presented in the following table.

Table 5: ***Girls Participation in Extra Activities (HW and CW)***

Range	Number of students in HW	percentage	Number of students in CW	percentage	Average	Percentage
90-100	1	5%	6	30%	4	20%
80-90	5	25%	8	40%	4	20%
70-80					5	25%
60-70	11	55%	6	30%	5	25%
50-60					2	10%
40-50	3	15%				
30-40						
20-30						
0-20						

Where, Outstanding (4.0): (90-100) %, Excellent (3.6): (80-90) %, Very good (3.2): (70-80) %, Good (2.8): (60-70) %, Satisfactory (2.4): (50-60) %, Acceptable (2): (40-50) %, Partially Acceptable (1.6): (30-40) %, Insufficient (1.2): (20-30) %, Very Insufficient (0.8): (0-20) %.

The finding recorded in table 5 showed that extra activities level of girl students in homework and classwork and their average level were given. One girl student has (90-100) %, five girl students have (80-90) %, eleven girl students have (60-70) %, and three girl students have (40-50) %, in doing homework. Likewise six girl students have (80-90) %, eight girl students' have (60-70) % and six girl students have (40-50) % in doing classwork. Then four girl student have (90-100) %, four girl students have (80-90) %, five girl students have (70-80) %, five girl students have (60-70) % and two girl students' have (50-60) % in average between homework and classwork.

From the above table found that 20% of girl students have (90-100) %, which is outstanding, 20% of girl students have (80-90) % which is excellent, 25% of girl

students have (70-80) % which is very good, 25% of girl students have (60-70) %, which is good and 40% of girl students have (50-60) %, which is satisfactory in extra activities percentage between homework and classwork. Then nobody of girl students participated below the 40% in average between homework and classwork. The result of table 5 found that 100% girl students have above satisfactory in participation in extra activities.

Analysis of Girls and Boys Achievement in School Science

Another objectives of the study was to compare the achievement of girl students with boy students in school science. The data obtained from the study are presented in terms of following topics.

Girls Achievement in School Science

Twenty selected girl students achievement from the two schools are presented in the following table according to achievement test conducted by researcher.

Table 6: ***Achievement of Girls***

Range	Number of students in achievement test	Percentage
90-100	1	5%
80-90	3	15%
70-80	3	15%
60-70	6	30%
50-60	5	25%
40-50	2	10%
30-40		
20-30		
0-20		

Where, Outstanding (4.0): (90-100) %, Excellent (3.6): (80-90) %, Very good (3.2): (70-80) %, Good (2.8): (60-70) %, Satisfactory (2.4): (50-60) %, Acceptable(2):

(40-50) %, Partially Acceptable (1.6): (30-40) %, Insufficient (1.2): (20-30) %, Very Insufficient (0.8): (0-20) %.

The finding recorded in table 6 showed that achievement level of girl students in achievement test are given. One girl student have (90-100) %, three girl students have (80-90) %, three girl students have (70-80) %, six girl students have (60-70) %, five girl students' have (50-60) % and two girl students' have (40-50) %.

From the above table found that 5% of girl students has (90-100) % which is outstanding, 15% of girl students have (80-90) % which is excellent, 15% of girl students have (70-80) % which is very good, 30% of girl students have (60-70) % which is good, 25% of girl students have (50-60) % which is satisfactory and 10% of girl students have (40-50) % which is acceptable in achievement test. Then nobody of girl students achieved below the 40% in achievement test. The result of table 6 found that 90% of girl students have above satisfactory whereas 10% of girl students have below satisfactory in achievement test conducted by researcher.

Boys Achievement in School Science

Twenty selected boy students achievement from the two schools are presented in the following table according to achievement test conducted by researcher.

Table 7: ***Achievement of boys***

Range	Number of students in achievement test	Percentage
90-100	1	5%
80-90	1	5%
70-80	4	20%
60-70	10	50%
50-60	2	10%
40-50	2	10%
30-40		
20-30		
0-20		

Where, Outstanding (4.0): (90-100) %, Excellent (3.6): (80-90) %, Very good (3.2): (70-80) %, Good (2.8): (60-70) %, Satisfactory (2.4): (50-60) %, Acceptable(2): (40-50) %, Partially Acceptable (1.6): (30-40) %, Insufficient (1.2): (20-30) %, Very Insufficient (0.8): (0-20) %.

The finding recorded in table 7 showed that achievement level of boy students in achievement test are given. One boy student have (90-100) %, one boy student has (80-90) %, four boy students have (70-80) %, ten boy students have (60-70) %, two boy students' have (50-60) % and two boy students' have (40-50) %.

From the above table found that 5% of boy student has (90-100) % which is outstanding, 5% of boy students have (80-90) % which is excellent, 20% of boy students have (70-80) % which is very good, 50% of boy students have (60-70) % which is good, 10% of boy students have (50-60) % which is satisfactory and 10% of boy students have (40-50) % which is acceptable in achievement test. Then nobody of boy students achieved below the 40% in achievement test. The result of table 7

found that 90% of boy students have above satisfactory whereas 10% of boy students have below satisfactory in achievement test conducted by researcher.

Table 7: *Compare the Achievement of Girls and Boys Students*

Sample size	Respondents	Mean Achievement (In percentage)
20	Girls	64.75%
20	Boys	65.13%

The finding recorded in table 8 showed that total obtained mark of girl students in achievement test conducted for research purpose have 64.75 % whereas boys have 65.13 %. The achievement of girl students have less with compare to boys in achievement test.

Analysis of T-test between Achievement of Girl and Boy Students

For compare the achievement of girl students with boy students in school science. The data obtained from the study are presented in terms of following topics.

For this, the researcher analysed the average achievement of girl and boy students obtained by the achievement test is calculated and presented in Appendix L and the summary is presented in Table No. 9

Table 8*: T-test between Achievement of Girl and Boy Students*

Sample size	Compared test	Average	T-test
20 (Girls)	Achievement of girls	64.75%	0.4632
20 (Boys)	Achievement of boys	65.13%	

The above table showed that the average achievement of the girl students is 64.75% and the average achievement of the boy students is 65.13%. This indicates that the boy students did slightly better than girl students.

The calculated t-test is 0.4632. The obtained t-test value indicates average achievement between girls and boys.

The t-test value between achievement of girls and boys is denoted by the following figure.

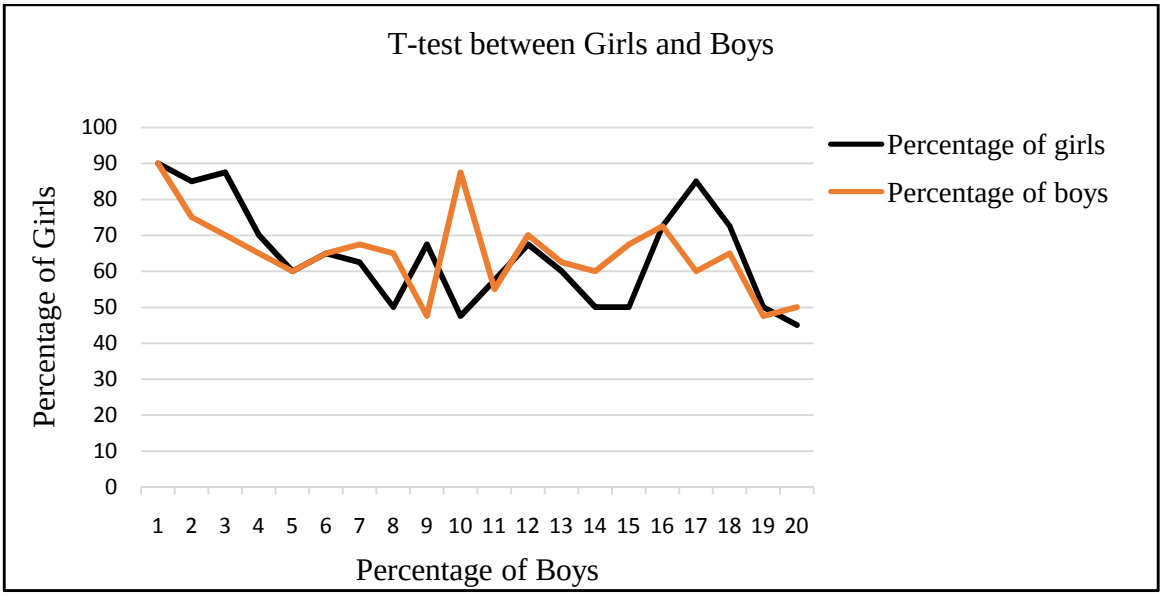


***Figure 2*: T-test between Achievement of Girl and Boy Students**

Analysis of the Correlation between Meaningful Engagement and Achievement of Girl Students

The analysis and interpretation of the data are made under the following headings and sub-headings.

Correlation between Class Attendance and Achievement of Girl Students

One of the objectives of the study was to find the correlation between girls' class attendance of grade IX (Baishakh-8 to Jeth-31) of 2076 and achievement test conducted by researcher.

For this, the researcher analysed the average achievement of girl students obtained from the achievement test and attendance of girl students is obtained by the

administrative record of grade IX of the school. To find out the coefficient of correlation the average scores obtained by the students in achievement test and classroom attendance is calculated and presented in Appendix M and the summary is presented in Table 10.

Table 9: ***Correlation between Class Attendance and Achievement of Girl Students***

Sample size	Compared test	Average	Coefficient of Correlation (r)
20	Class attendance of girls	89.24%	0.6394
	Achievement of girls	64.75%	

The above table showed that the average class attendance of the girl students is 89.24% and the average achievement of the girl students is 64.75%. This indicates that the girl students' class attendance did better than achievement of girl students.

The calculated correlation 'r' value is (+) 0.6394 which is positive correlation and deviated towards (+) 1. The obtained coefficient of correlation value indicates average achievement of girl students and class attendance of girl students.

The correlation between achievement of girls and class attendance of girl students is denoted by the following figure.

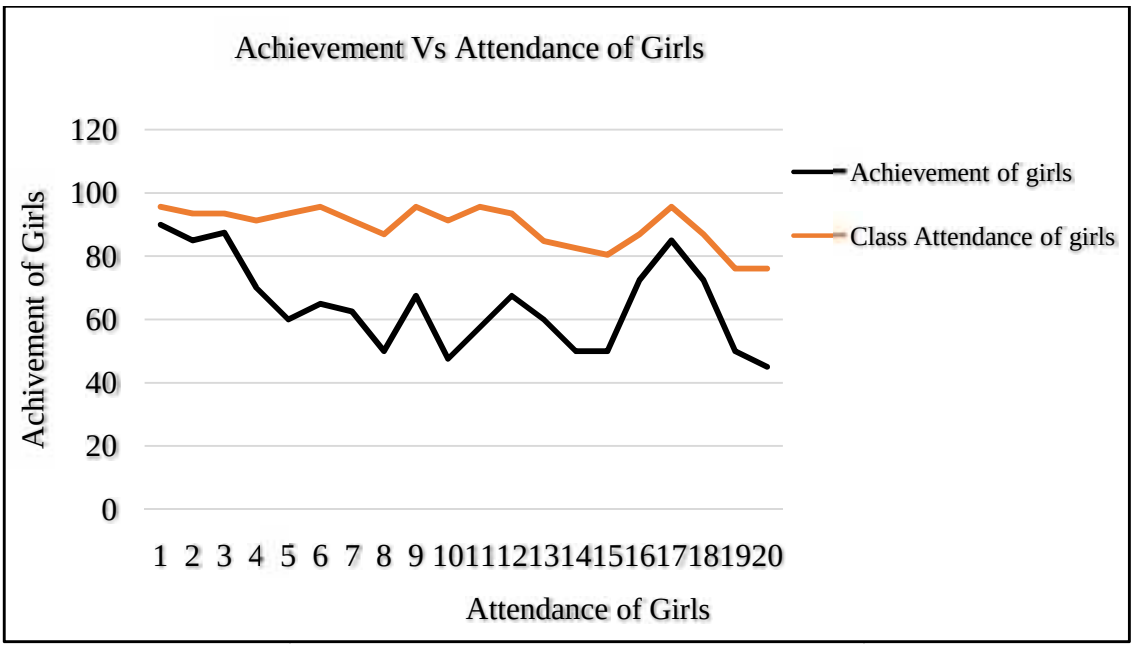


***Figure 3*: Correlation between Achievement and Attendance of Girls**

Correlation between Classroom Interaction and Achievement of Girl Students

One of the objectives of the study was to find the correlation between girls' classroom interaction and average achievement which is conducted for research purpose.

For this, the researcher analysed the average achievement of girl students obtained by the achievement test and classroom interaction of girl students is obtained by the classroom observation and other research tools. To find out the coefficient of correlation the average scores obtained by the students from achievement test and classroom interaction is calculated and presented in Appendix N and the summary is presented in Table No. 11.

Table 10: ***Correlation between Classroom Interaction and Achievement of Girl Students***

Sample size	Compared test	Average	Coefficient of Correlation (r)
20	Classroom interaction of girls Achievement of girls	60% 64.75%	0.5912

The above table shows that the average classroom interaction of the girl students is 60% and the average achievement of the girl students is 64.75%. This indicates that the girl students' achievement did better than classroom interaction of girl students. The calculated correlation 'r' value is (+) 0.5912 which is positive correlation. The obtained coefficient of correlation value indicates classroom interaction of girl students and average achievement of girl students.

The correlation between classroom interaction of girl students and achievement of girls is denoted by the following figure.

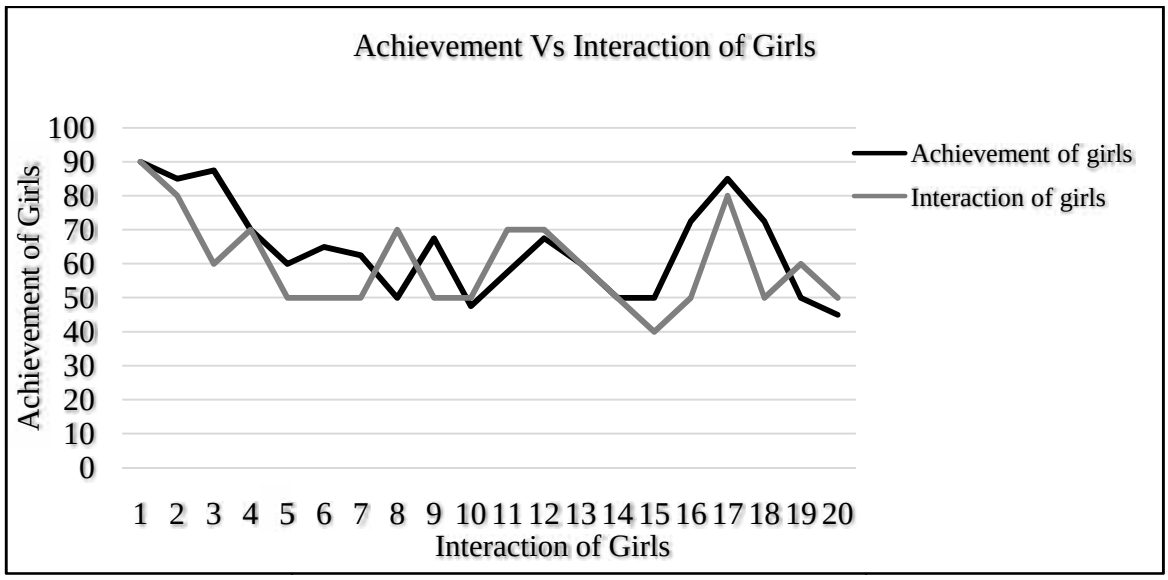


***Figure 4*: Correlation between Achievement and Classroom Interaction of Girl Students**

Correlation between Extra Activities (HW and CW) and Achievement of Girl Students

One of the objectives of the study was to find the correlation between girls' extra activities (HW and CW) and achievement in school science.

For this, the researcher analysed the average achievement of girl students obtained by the achievement test and extra activities (HW and CW) of girl students is obtained by the classroom observation and other research tools. To find out the coefficient of correlation the average scores obtained by the achievement test and extra activities (HW and CW) is calculated and presented in Appendix O and the summary is presented in Table No. 12.

Table 11: ***Correlation between Extra Activities (HW and CW) and Achievement of Girl Students***

Sample size	Compared test	Average	Coefficient of Correlation (r)
20	Extra activities (HW and CW) of girls Achievement of girls	65% 64.75%	0.8193

The above table shows that the average extra activities (HW and CW) of the girl students is 65% and the average achievement of the girl students is 64.75%. This indicates that the girl students' extra activities (HW and CW) did slightly better than achievement of girl students.

The calculated correlation 'r' value is (+) 0.8193 which is positive correlation deviated towards (+1). The obtained coefficient of correlation value indicates extra activities (HW and CW) of girl students and average achievement of girl students.

The correlation between extra activities (HW and CW) of girl students and achievement of girls is denoted by the following figure.

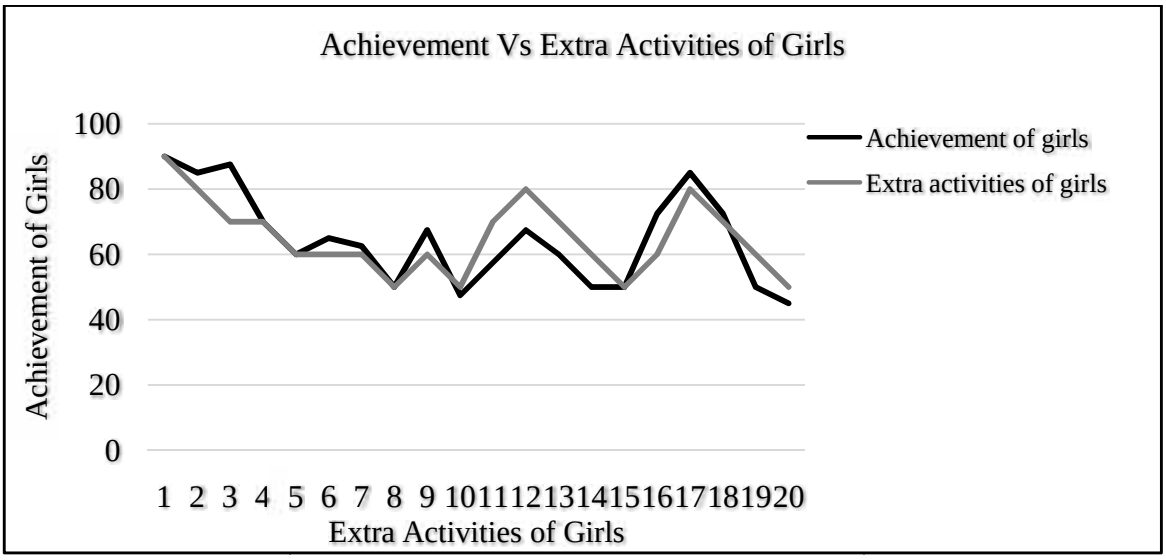


***Figure 5*: Correlation between Achievement and Extra Activities (HW and CW) of Girl Students**

Correlation between Meaningful Engagement and Achievement of Girl Students

One of the objectives of the study was to find the correlation between girls' meaningful engagement and achievement in school science.

For this, the researcher analysed the average achievement of girl students obtained by the achievement test and overall engagement of girl students is obtained by the class attendance, classroom interaction, extra activities (HW and CW) which is collected from administrative record of school, classroom observation and other research tools. To find out the coefficient of correlation the average scores obtained by the students' achievement test and overall engagement is calculated and presented in Appendix P and the summary is presented in Table No. 13.

Table 12: ***Correlation between Meaningful Engagement and Achievement of Girl Students***

Sample size	Compared test	Average	Coefficient of Correlation (r)
20	Overall engagement of girls	71.45%	0.7828
	Achievement of girls	64.75%	

The above table shows that the overall engagement of the girl students is 71.45% and the average achievement of the girl students is 64.75%. This indicates that the girl students' overall engagement did better than achievement of girl students.

The calculated correlation 'r' value is (+) 0.7828 which is positive correlation deviated towards (+1). The obtained coefficient of correlation value indicates overall engagement and average achievement of girl students.

The correlation between overall engagement of girl students and achievement of girls is denoted by the following figure.

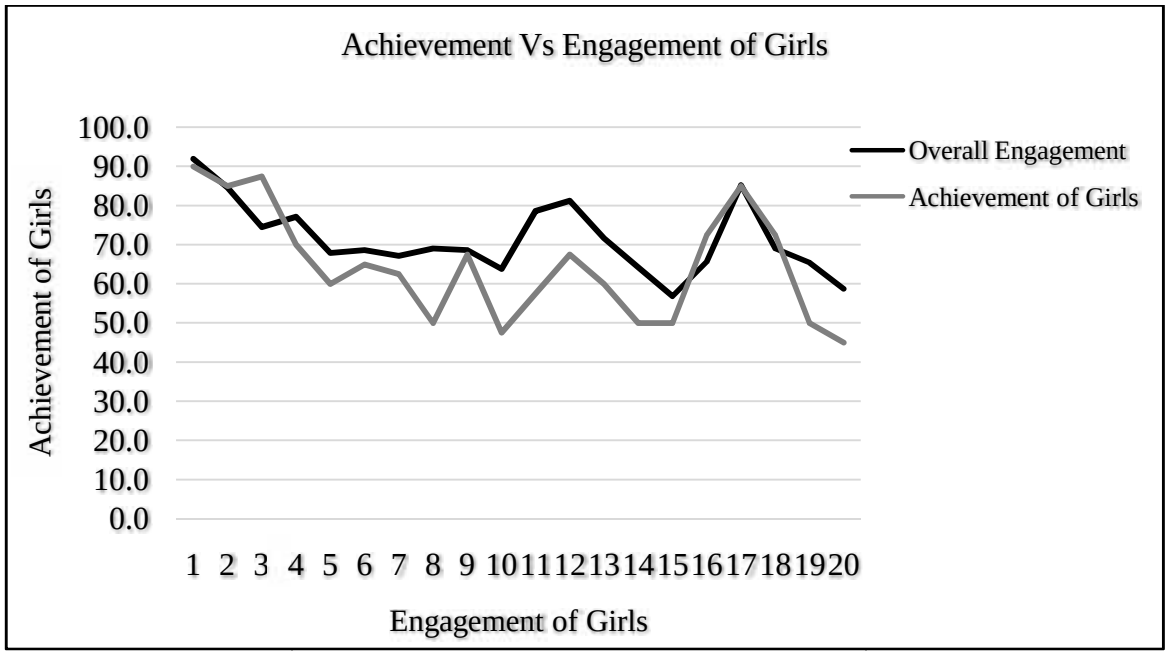


Figure 6: **Correlation between Achievement and Engagement of Girl Students**

Analysis of the Factors Affecting of Girls Engagement in Classroom in School Science

One of the objectives of the study was to find the factors affecting of girls engagement in classroom in school science. The analysis and interpretation of the data are made under the following headings and sub-headings.

Analysis of the Factors Affecting of Girls Engagement in Classroom according to Teachers Class Observation Form

For this, the researcher a Likert's Scale of teachers class observation form is constructed on the basis of five alternatives such as Always, Often, Sometimes, Seldom and Never and different statements. Then collected data and interpretation related to the factors affecting of girls engagement in classroom in school science. Two teachers of science subject of secondary level which had been teaching in grade IX was selected from the two schools for this research and their class is observed within five days. Both school is selected in English medium section of grade IX.

Language Used in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority only girls and only boys in class observation days. He often gave equal priority to both girls and boys. Then he seldom used bias language like 'Moti' and often used respective and polite language with girls. The language used by teacher in classroom is affected the positively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority only girls and only boys in class observation days. He often gave equal priority to both girls and boys. Then he seldom

used bias language and often use respective and polite language with girls. The language used by teacher in classroom is affected positively in the engagement of girls in classroom.

Distribution of Work in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority to only girls and only boys in distribution of works in class observation days. He often gave equal priority to both girls and boys and distributed the same works for girls and boys. The distribution of work in classroom by teacher is not affected the negatively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority to only girls and only boys in distribution of works in class observation days. He always gave equal priority to both girls and boys. He distributed the same works for girls and boys. The distribution of work in classroom by teacher is not affected the negatively in engagement of girls in classroom.

Gender Disparity in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave disparity for girls and boys in class observation days. He often gave equal priority to both girls and boys. He distributed the same works, gave equal priority in homework and classwork, evaluation, motivation for girls and boys. Due to never giving disparity in gender the classroom of science teacher is not affected the negatively in engagement of girl students in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave disparity for girls and boys in class observation

days. He often gave equal priority to both girls and boys. He distributed the same works, gave equal priority in homework and classwork, evaluation, motivation for girls and boys. Due to never giving disparity in gender the classroom of science teacher is not affected the negatively in engagement of girl students in classroom.

Checking Homework and Classwork in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority to only girls and only boys for checking homework and classwork in class observation days. He often gave equal priority to both girls and boys in checking homework and classwork. Girls and boys both were satisfied with their teacher. The checking homework and classwork in classroom by teacher is not affected the negatively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority to only girls and only boys in checking homework and classwork in class observation days. He often gave equal priority to both girls and boys in checking homework and classwork. Girls and boys both were satisfied with their teacher. The checking homework and classwork in classroom by teacher is not affected the negatively in engagement of girls in classroom.

Classroom Arrangement by the Teacher

Both subject teacher of science subject of Shree Sharada Secondary school and subject teacher of science subject of Shree Balshiksha Secondary school were arranged the sitting style of students in same position. They often kept one side girls and other side boys in classroom. They neither kept before girls and after boys nor before boys and after girls in bench of the class. Both teachers kept girls and boys

randomly during some group works and they categorized all students on the basis of class Roll No but not priority by the gender.

Motivation in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority only girls and only boys in motivation in class observation days. He often gave equal priority to both girls and boys in motivation. Then he seldom motivated weak students but not used gender disparity between girls and boys. The motivation used by teacher in classroom is affected the positively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority only girls and only boys in motivation in class observation days. He often gave equal priority to both girls and boys in motivation. Then he seldom motivated weak students in subject matter in his subject but not used gender disparity and bias language between girls and boys. The motivation used by teacher in classroom is affected the positively in engagement of girls in classroom.

Evaluation in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority to only girls and only boys in evaluation in class observation days. He often gave some comments for students to improve their weaknesses. For this, he gave equal priority to both girls and boys. The evaluation used by teacher in classroom is affected the positively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority to only girls and only boys in

evaluation of students in class observation days. He always gave equal priority to both girls and boys and he evaluated the both girls and boys in same ways. The evaluation in classroom by teacher is not affected the negatively in engagement of girls in classroom.

Give Feedback in Classroom by the Teacher

The subject teacher of science subject of Shree Sharada Secondary school was never gave priority to only girls and only boys in feedback in class observation days. He often gave immediate feedback for students but not priority either girls or boys. He seldom gave feedback after sometimes but he always give feedbacks to the students. The feedback given by teacher in classroom is affected the positively in engagement of girls in classroom.

Other hands the subject teacher of science subject of Shree Balshiksha Secondary school was also never gave priority to only girls and only boys in feedback of students in class observation days. He often gave immediate feedback for students but not priority either girls or boys. He seldom gave feedback after sometimes but he always give feedbacks to the students. The feedback given by teacher is not affected the negatively in engagement of girls in classroom.

Analysis of the Factors Affecting of Girls Engagement in Classroom according to Students Class Observation Form

For this, the researcher a Likert's Scale of students class observation form is constructed on the basis of five alternatives such as Always, Often, Sometimes, Seldom and Never and different statements. Then collected data and interpretation related to the factors affecting of girls engagement in classroom in school science. Forty (twenty girls and twenty boys) students was selected from the two schools for

this research. Among them twenty girl students' of class nine is observed within five days and collected data with the help of students class observation form.

Regularity in School of the Girl Students

The girl students of both schools Shree Sharada Secondary school and Shree Balshiksha Secondary school were always coming regular in school. They did always arrive at time in school, familiar with the school community, did homework and stayed at school 10 AM to 4 PM in school opening days. From the class observation of twenty girl students by using Likert's Scale being five alternatives such as Always, Often, Sometimes, Seldom and Never. The 100% of girl students did always arrive at time in school, familiar with the school community, did homework and stayed at school 10 AM to 4 PM in school opening days. From the observation of class of girl students' researcher found that all girl students did fully satisfy and engage with school environment.

Interaction of Girl Students with Teacher

The girl students of both schools Shree Sharada Secondary school and Shree Balshiksha Secondary school did interact with teacher. The 100% of girl students did always interest with teacher for science problem, felt comfortable enough to ask questions with teacher, felt supported by teacher and felt teacher as a good facilitators. They did mark in Always among five alternatives such as Always, Often, Sometimes, Seldom and Never. Then 80% of girl students did mark in alternative Always, 10% of girl students did mark in Often and 10% of girl students did mark in Sometimes in statement 'ask questions when don't fully understand' . From the class observation of twenty girl students by using Likert's Scale being five alternatives such as Always, Often, Sometimes, Seldom and Never the researcher found that most of the girl

students did interact with teacher by the different ways and some of the girl students did a bit shy while being not fully understand and they did not interact with teacher.

Involvement in Homework of Girl Students

The girl students of both schools Shree Sharada Secondary school and Shree Balshiksha Secondary school did involve in homework. The 100% of girl students did always science homework, rewarded by science teacher for good homework and interested in science problem. They did mark in Always among five alternatives such as Always, Often, Sometimes, Seldom and Never. Then 40% of girl students did mark in alternative Always, 40% of girl students did mark in Often and 20% of girl students did mark in Sometimes in statement 'evaluate myself'. Then 90% of girl students did mark in alternative Always and 10% of girl students did mark in Sometimes in statement 'parents help for doing homework'. From the class observation of twenty girl students by using Likert's Scale being five alternatives such as Always, Often, Sometimes, Seldom and Never the researcher found that most of the girl students did involve in homework. From the observation of class of girl students' researcher concluded that all girl students did fully satisfy and engage in homework.

Interaction of girl Students with Peers

The girl students of both schools Shree Sharada Secondary school and Shree Balshiksha Secondary school did interact with peers. The 100% of girl students did mark always among five alternatives such as Always, Often, Sometimes, Seldom and Never in Statements participate in class work with peers, feel classroom interactions reflect collaborative working relationships among peers, participate with friends in science experiments, friends help in science problem and feel work well in groups.

From the class observation of twenty girl students by using Likert's Scale researcher concluded that all girl students did interact and engage well with peers.

School Facilities for Girl Students

The girl students of both schools Shree Sharada Secondary school and Shree Balshiksha Secondary school did involve in school. School facility is the one of the factors which affect the girl students' engagement. The 100% of girl students did mark in Always among five alternatives such as Always, Often, Sometimes, Seldom and Never in statements ' facility of girls toilet and availability of rest room during ill . Then 100 % of girl students did mark in alternative Never in statement 'availability of sanitary pad'. From the class observation of twenty girl students by using Likert's Scale being five alternatives such as Always, Often, Sometimes, Seldom and Never the researcher found that all girl students did facilitate in girls toilet and rest room during ill but all girl students did not facilitate in availability of sanitary pad. From the observation of class of girl students' the researcher concluded that all girl students did not fully satisfy in facility of school. Some girl students did not feel easy for read in menstruation period and they did expect from the school for availability of sanitary pad.

Analysis the Engagement and Achievement of Girl Students and Factors Affecting of Girls Engagement According to Interview Paper

According to the interview sheet paper of teacher, the two teachers of science subject of the two selected school is selected. Likewise, according to the interview sheet paper of student, the two students of the two selected school is also selected for collecting data and interpretation. Then collected data and interpretation related to

engagement and achievement of girl students and factors affecting of girl students in school science is analysed.

Analysis the Engagement and Achievement of Girl Students and Factors Affecting of Girls Engagement According to Interview Paper of Teacher

The engagement and achievement of girl students and factors affecting of girl students in school science according to interview paper of teacher were as follows.

The subject teacher of science subject of Shree Sharada Secondary school said that he feeling very happy being a science teacher. He also said that gender played significant role in science teaching because in menstruation period especially girls are absent in class. In the period of that time gender played significant role in science as well as other subject teaching. He also said that students make similar kind of friends. Normally, boys make a friend only with boys and girls also make friends only with girls. Then, they share their emotions, feelings separately with similar gender but in subject matter and classroom activities there is no any different level of interest of students in his class in terms of gender.

The subject teacher of science subject of Shree Balshiksha Secondary school said that he feeling very happy being a science teacher. He said that gender played equal role in science teaching. He also said that in subject matter and classroom activities there is no any different level of interest of students in his class in terms of gender.

In the term of achievement of students the science teacher of Shree Sharada Secondary school is not satisfied in previous examination and he said that girl achieve the first position in previous exam and girl has higher achievement in previous examination than boys. He also said that the causes of lower achievement of the boys

are come from the low educated homely background, makes a friend with same level, do not have interest curious to learn and poor homely background.

Likewise in the term of achievement of students the science teacher of Shree Balshiksha Secondary school is a bit of satisfied in previous examination but not fully satisfied. He said that girl achieve the first position in previous exam and girl has higher achievement in previous examination than boys. He also said that the causes of lower achievement of the boys are science is one of the hard subject, students come from the low educated homely background, do not have interest curious to learn.

Subject teacher of science of Shree Sharada Secondary school said that all chapters of chemistry in science books of class nine have difficult for students but there is no any chapters in science which only girls are feel difficult than boys. The researcher found that he deals with gender perspective in science by showing equal behavior between girls and boys, by helping and reducing the gender discriminations, by developing positive thinking among them and grouping the girls and boys in classroom activities.

Subject teacher of science subject of Shree Balshiksha Secondary school ssid that all chapters of chemistry in science books specially chemical reaction of class nine have difficult for students but there is no any chapters in science which girls are feel difficult than boys. The researcher found that he deals with gender perspective in science by showing equal behavior between girls and boys and by helping reducing the gender discriminations.

The science teacher of Shree Sharada Secondary school said that there is significant relationship between engagement and achievement of students. He also said that who engaged to reading and writing their achievement is also high, who have

interest or curios to reading and writing their achievement is also high and regular students had high achievement than absent students. He said that both girls and boys get equal involved in action, both are equally participated in learning science and both are equally engaged in classroom interaction with science subjects. He said that for achieve balance regarding academic achieving among girls and boys students distinct ways of achieving academic lesson in the same class are try to understand their problem in deeply and treat by psychologically, to manage in their sitting style in classroom between talented and non-talented students, equally encourage for students to study, use different methodology and change into modern teaching pattern. He also said that both girls and boys are equally engaged in practical activities in science and doing homework.

The teacher of science subject of Shree Balshiksha Secondary school also said that there is significant relationship between engagement and achievement of students. Who engaged to reading and writing their achievement is also high and regular students had high achievement than absent students. He said that both girls and boys get equal involved in action, both are equally participated in learning science and both are equally engaged in classroom interaction with science subjects. He also said that for achieve balance regarding academic achieving among girls and boys students distinct ways of achieving academic lesson in the same class are equally encourage for students to study and by teaching different method for different topics.. He also said that both are equally engaged in practical activities in science and doing homework.

The science teacher of Shree Sharada Secondary school said that the main problems facing by him especially in science teaching are lack of materials and method how to teach science, lack of well-equipped laboratory and lack of time for

practical activities. Finally he suggested that for regarding the betterment of girl's engagement and achievement in secondary science are providing equal opportunities for study, creating a good environment for girls' welfare, convincing the parents about importance of female education and requested to parents for send their children regularly in school.

The teacher of science subject of Shree Balshiksha Secondary school also said that the main problems facing by him especially in science teaching are lack of materials and method how to teach science, lack of well-equipped laboratory and students came with less concept from previous class. Finally he suggested that for regarding the betterment of girl's engagement and achievement in secondary science are by providing more practically activities for students and giving more priority to girls for uplift in society, by pushing them with positive response for better engagement, giving them responsibility in involving in science subject, helping them to achieve better result in secondary science and being friendly with girls in any subject matter helps to girls in engagement and achievement better result in secondary science.

Analysis the Engagement and Achievement Level of Girl and Factors Affecting of Girls Engagement According to Interview Paper of Students

The engagement and achievement of girl students and factors affecting of girl students in school science according to interview paper of teacher were as follows.

The name of the student selected for research purpose from Shree Sharada Secondary School was Devi Newar. She has been studying in class nine and living in Bahrabise-5 Gati, Sindhupalchok which is 1:30 hour (by foot) far from the school. And the name of the student selected for research purpose from Shree Balshiksha

Secondary School was Kristina Tamang. She has been studying in class nine and living in Balephi-7 Mankha, Sindhupalchok which is 20 minutes (by foot) far from the school.

The student of Shree Sharada Secondary School said that she was a regular students of the school but according head teacher and science teacher she was not a regular students of the school. The researcher found that she feeling good being a girl but not fully proud to be a girl. She said that she satisfied with her science teacher because her science teacher is friendly and her interested subject is social.

The student of Shree Balshiksha Secondary School said that she was a regular students of the school and her attendance in class eight is also good. The researcher found that she feeling very proud being a girl. She also said that girl have more facilities than boys. She is satisfied with her science teacher because her science teacher is friendly and genius and her interested subject is Mathematics.

The student of Shree Sharada Secondary School and the student of Shree Balshiksha Secondary School both said that they had the access to the science laboratory for the practical classes. they also said that their science teacher called them by the name, asked equal number of questions for girls and boys, participated in practical class both boys and girls and completed the course in time.

The researchers also found that the student of Shree Sharada Secondary School and the student of Shree Balshiksha Secondary School both said that girl achieved the first position in previous class, the position of the girls is better with compared to boys but in class nine some boys have better performance in class which are coming from another schools.

The student of Shree Sharada Secondary School said that she completed her class work and home work regularly which her science teacher did not accept. She also seen to be weak in achievement test taken by researcher. Researchers also found that some factors such as illiterate family background, lack of time for taken additional class, far from the school and according to head teacher there is more difficulty in teaching science than any other subject as it cannot be taught by every teacher etc. were her caused of less achievement.

The student of Shree Balshiksha Secondary School said that she completed her class work and home work regularly which her head teacher and science teacher also accept. She was also seen to be good in achievement test taken by researcher. The researcher also found that some factors such as literate family background, time for taken additional class, and support from the school were her caused of more achievement.

The researchers also found that the student of Shree Sharada Secondary School and the student of Shree Balshiksha Secondary School both said that they have female friendly toilet in their school but they have not availability of sanitary pad in their Schools.

The student of Shree Sharada Secondary School said that she having not any good or helping friends in her class and she sometimes discussed about the science problem with her science teacher. Chemical Reaction chapters in science books of class nine was her difficult and Natural Disaster was much interested topics for her.

The student of Shree Balshiksha Secondary School said that she having good or helping friends in her class and she often discuss about the science problem with

her science teacher. Chemical Reaction and Some Gases chapters in science book of class nine was her difficult and Sense Organ is too much interested topics for her.

The student of Shree Sharada Secondary School and the student of Shree Balshiksha Secondary School both said that there was equally participated of their teachers for girls and boys in learning science such as there is equally engaged in making improvisation materials, classroom interaction, practical activities in science subject, problem solving activities related to science. The researcher also found that there was not any problem facing in school but sometimes due to unavailability of sanitary pad in school facing ladies problem during menstruation period which affect the directly in engagement in classroom. Then researcher also found that their science teacher did not cooperate for solving these problems and head teacher said that it is difficult to manage due to the lack of property and man power in the school.

The student of Shree Sharada Secondary School said that she facing some problem in house and community such as her parents did not support for read like her brother. Parents did not give enough money for lunch box and stationery, did not give enough time for doing homework like brother. Then researcher also found that science teacher did not cooperate her in solving these problems.

The student of Shree Balshiksha Secondary School said that she did not facing different problem such as lack of time for doing homework, parents gave enough money for stationery and lunch box, gave enough time for additional class. Then researcher also found that science teacher did not cooperate her but due to literate parents she achieved and engaged better in school.

At last, researcher can conclude that, due to the less engagement in school and many problem facing in house by the girl gained low achievement. The sufficient

engagement in school help to gain more achievement for girls. Both engagement and achievement are correlated with each other.

CHAPTER V

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

After analysing and interpreting the data, the researcher tried to derive conclusion and recommendation for further study. The first section revels the finding of the study, second section describes the conclusion of the study on the basis of research analysis and the last section presents the recommendation based on the finding of the study.

The objectives of the study were to explore the girls' meaningful engagement in school science at secondary level. To compare the achievement of girl students in school science with boy students. To find the correlation between meaningful engagement and achievement of girl students in school science. And to find out the factors affecting of girls engagement in classroom. The researcher used one set of achievement test item, two sets of interview papers which is one for teacher and another for students and two sets of Likert's Scale which is one for teachers and another for students as tools for collecting primary. Then used Pearson's formula to calculate the coefficient of correlation (r) and collected the data. Then the collected information were analysed in descriptive form.

Finding of the Study

The findings of the study based on the analysis and interpretation of data were as follows:

- As a whole, the average scores in achievement of girls obtained by achievement test was found to be 64.75%.
- As a whole, the average scores in achievement of boys obtained by achievement test was found to be 65.13%.

- As a whole, the average scores in class attendance of girls obtained by administrative record of school was found to be 89.24%.
- As a whole, the average scores in interaction with teachers and peers of girls obtained by classroom observation was found to be 60%.
- As a whole, the average scores in extra activities (HW and CW) of girls obtained by classroom observation was found to be 65%.
- As a whole, the average scores in overall engagement of girls obtained by classroom observation and administrative record of school was found to be 71.45%.
- The researcher found that engagement of girls in class attendance was maximum (89.24%) and interaction with teacher and peers was minimum (60%).
- It was found that all compared groups have positive correlation with different degrees. However, there was not any perfect positive and perfect negative correlation.
- Comparing the coefficient of correlation by gender, it was found that the correlation between achievement of girls and boys was 0.3919 which is positive correlation.
- The coefficient of correlation between achievement and class attendance of the girl students of grade nine was 0.6394 which is positive correlation.
- The coefficient of correlation between achievement and interaction with teacher and peers of the girl students of grade nine was 0.5912 which is positive correlation.

- The coefficient of correlation between achievement and extra activities (HW and CW) of the girl students of grade nine was 0.8193 which is positive correlation.
- The coefficient of correlation between achievement and overall engagement of the girl students of grade nine was 0.7828 which is also positive correlation.
- The researcher found that the correlation between achievement and extra activities (HW and CW) of the girl students was maximum and the correlation between achievement and interaction with teacher and peers of the girl students was minimum.
- The researcher also found that the main factors of girl engagement in school was menstruation period of girls which affected the participation of girls in classroom directly.
- Background of the family, environment of the school, management system of the school background of the friends, curiosity of the students and interest of the students was also found the factors of girl engagement.
- The researcher also found that the achievement of girls was more than boys in previous class but in present class the achievement of the boys is slightly better than girls.

Conclusions

The finding of the study, it is found that there was positive correlation between meaningful engagement and achievement of girls in school science. The main objective of the study was to explore the girls' meaningful engagement in school science at secondary level. The researcher analysed the engagement of girls in attendance, interaction with teachers and peers and extra activities such as homework

and class work. The researcher found that engagement of girls in class attendance was maximum and average interaction with teacher and peers was minimum.

The researcher conducted an achievement test for compare the achievement of girls and boys. Then researcher found that the achievement of boy students was slightly better than achievement of girl students. The researcher also found that the achievement of girls was more than boys in previous class (grade VIII) but in present class (grade IX) the achievement of the boys was slightly better than girls due to some boys were coming from other schools and their performance was good in achievement test.

The researcher found that the overall engagement of girls from the class attendance, interaction with teachers and peers and extra activities such as homework and class work. And achievement of girl students was found from achievement test. Then the researcher analysed the correlation between achievement and class attendance of girls, achievement and interaction with teachers and peers of girls' and achievement and extra activities such as homework and class work of girls. The researcher found that the correlation between achievement and extra activities (HW and CW) of the girl students was maximum and the correlation between achievement and interaction with teacher and peers of the girl students was minimum.

The researcher found that the main factors of girl engagement in school was menstruation period of girls which affected the participation of girls in classroom directly. . The researcher also found that background of the family, environment of the school, management system of the school background of the friends, curiosity of the students and interest of the students was other factors of girl engagement.

Recommendations

On the basis of finding and conclusion of the study some measure has been recommended for the improvement of girls' achievement and engagement in school science was given below. It was found that, the correlation between meaningful engagement and achievement of the girl students of grade nine is positive. As a whole, greater positive correlation is found in the meaningful engagement and achievement. The close connection between meaningful engagement and achievement is interesting fact for the people concerned with pedagogical area. So, to make connection strong following points should be considered

- Different degrees of correlation were found among the compared variables engagement and achievement of girls. So in gender, schools with lower degree of correlation should be provided with different facilities and instructional materials with effective teaching.
- The curriculum designers should reform the curriculum according to the level of students by maintaining the balance and standard between meaningful engagement and achievement of students.
- The teacher should cooperate with parents about engagement, achievement and factors affecting of girl education.
- The teacher and guardian should providing equal opportunities for girls and boys in learning science.
- The administrative department of the school should manage sanitary pad for girls during in the school time
- This study was conducted in Sindhupalchok district taking only two government schools. To get valid and reliable result, it should be extended to national level.

References

Adhikari, B.M. (2013). *Gender Inequality and the Problem with Girls' School Attendance in Nepal*, Faculty of Social Sciences, Norway: University of Nordland.

Alam, S. N. (2017). *Participation of Muslim Students in Mathematics.* Unpublished Master thesis, T.U., Kirtipur.

Aryal, G. (2014). *Participation of Muslim Girl Students in Mathematics Learning in Lower Secondary Level*, Unpublished Master thesis, T.U., Kirtipur.

Bhattarai, A.R. (2014). *How rural women experience disempowered in Nepal : an empirical study on women experience as the main obstacles to their disempowerment in their everyday lives*. University Nordland.

Bista, M. (2004). *Review of Research Literature on Girls' Education in Nepal*, United Nations Educational, Scientific and Cultural Organization, Kathmandu Office.

CERID, 1981. *Factors Affecting Science Teaching/Learning at Secondary Level in Nepal*, Tribhuvan University, KIrtipur, Kathmandu.

CERID, 1991. *Status of Universalization of Primary Education for Girls*. CERID. T.U.

CERID, 1998. *Teacher Training and it Implications in Classroom Practices*. A study Report, CERID, T.U.

CERID, 1999. *Increase of Female Teacher in Rural Schools of Nepal*: Kathmandu. CERID. T.U

CERID, 2002. *Access to Education for Disadvantaged Group*. Formative Research Project, Study Report 3. Kathmandu. CERID.

CERID, 2004. *Female Teachers in Primary Schools: Distribution Pattern, Training and Transfer*. CERID: Kathmandu.

CERID, 2004. *Gender Experience in Public Schools of Nepal***,** Kathmandu. CERID.T.U.

Crossman, A. (2018) *Feminist Theory in Sociology,* ThoughtCo is part of the Dotdash Publishing Family.

Danai, S. (2015). *Correlation Study between Student's Attitude and Achievement on Mathematics*. Unpublished Master thesis, T.U., Kirtipur.

Devkota, S. (2017). *Participation of Girls in Mathematics*, Unpublished Master thesis, T.U., Kirtipur.

Dhakal, R. (2015). *Correlation Analysis of Science Result in Send Up and SLC Examination at Gorkha District,* Unpublished Master thesis, T.U., Kirtipur.

Dweck, C. S. (1986). Motivational processes affect learning. *American Psychologist*, 41, 10401048

Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. H. Mussen (Gen. Ed.) & E. M. Hetherington (Vol. Ed.), *Handbook of child psychology: Vol. IV. Social and personality development* (pp. 643-691). New York: Wiley.

Education system Nepal | EP-Nuffic | 1st edition December 2014 | version 1, January 2015

Government of Nepal (2001-2015), EFA. *National Review Report,* Kathmandu.

Hersam, M., M. Luna and G. Light (2004). *Implementation of Interdisciplinary Group Learning and Peer Assessment in a Nanotechnology Engineering Course.* Journal of Engineering Education, 93, 4957.

Kalra R. M. & Gupta V. (2012). *Teaching of Science: A Modern Approach.* New Delhi: Amazon Asia-Pacific Holdings Private Limited.

Karki, S. (2011). *Factors Causing Low Achievement in Mathematics at Secondary Level*, Unpublished Master thesis, T.U., Kirtipur.

Khanal, P. (2016). *Research Methodology in Education* (1st ed.). Kathmandu: Sunlight publication.

Magar, A.D. (2012). *Female Participation in Higher Level Mathematics Education.World's Languages*. Oxford: Oxford university press.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328-346.

Pandit, C.N. (2010). *Modern Science Teaching* (B.Ed.). Kathmandu: Bidur prakasan.

Pant, S. (2002). *A Study of Achievement and Participation of Female in Bachelor's Level,* Unpublished Master thesis, T.U., Kirtipur.

Rawat, D.B. (2015*). Participation of Girls at Higher Secondary Level Mathematics in Surkhet District.* Unpublished Master thesis, T.U., Kirtipur.

Sharma, R. (2015). *Correlation between Learning Styles and Achievement Scores of Mathematics*. Unpublished Master thesis, T.U., Kirtipur.

Shen, J. (2004). *Participatory Learning Approach: A Research Agenda*. Information Systems Department College of Computing Sciences New Jersey Institute of Technology.

Sodhi, R. (2012). *Domestic Violence Laws in the United States and India*. India: Punjab and Haryana High Court.

Thapa, N. (2012). *Participation and Achievement of Dalit Students in Lower Secondary Level.* Unpublished Master thesis, T.U., Kirtipur.

Yadav, J.K. (201**1).** *A Comparative Study of the Secondary Level Students' Achievement in Science at Public Schools and Private Schools at Siraha District***,** Unpublished Master thesis, T.U., Kirtipur.

Appendix-A

Teacher's Class Observation Form

Name of the school: Subject:

Address: Period:

Teacher's name: Class:

Teaching unit: Topic:

No. of students: Class observed

Date:

S.N.	Areas	Always	Often	Sometimes	Seldom	Never	Remarks
1.	Language use in classroom						
	Priority to girls						
	Priority to boys						
	Equal priority to both girls and boys						
	Use bias language						
	Use respective language						
2.	Distribution of work						
	Priority to girls						
	Priority to boys						
	Equal priority to both girls and boys						

3.	Gender disparity						
	Priority to girls						
	Priority to boys						
	Equal priority to both girls and boys						
4.	Homework and classwork						
	Priority to girls						
	Priority to boys						
	Equal priority to both girls and boys						
5.	Classroom arrangement						
	Before girls and after boys						
	Before boys and after girls						
	One side girls and one side boys						
	Girls and boys randomly						
6.	Motivation						
	Priority to girls						
	Priority to boys						

	Equal priority to both girls and boys						
7.	Evaluation						
	Priority to girls						
	Priority to boys						
	Equal priority to both girls and boys						
8.	Feedback						
	Immediate feedback						
	After sometimes						
	No feedback						

Appendix-B

Student's Class Observation form

There are some statements. There is no right or wrong answer. The options vary in degree only. The right answer is your opinion about own feeling. Please, read the statement carefully and give your judgment about the intensity of statement by putting tick mark ( ) on any one of the three choices of each statement.

Students name: Date:

Schools name: Class:

S.N.	Statements	Always	Often	Sometimes	Seldom	Never	remarks
1.	Regularity in school						
a	Arrive at time						
b.	Familiar with the school community						
c.	Do class work						
d.	Stay at school 10 AM to 4 PM						
e.	Coming regular in school opening days						
2.	Interaction with teacher						
a.	Interest with teachers for science problems						
b.	Feel comfortable enough to ask questions with teacher						
c.	Feel supported by teachers.						

d.	Feel teacher is a good facilitator						
e.	Ask questions when don't fully understand.						
3.	Involvement in homework						
a.	Do science homework						
b.	Interested in science problem						
c.	Evaluate myself.						
d.	Parents help for doing homework						
e.	Rewarded by teacher for good homework						
4.	Interaction with peers						
a.	Participate in class work.						
b.	Feel classroom interactions reflect collaborative working relationships among peers.						
c.	Participate with friends in science experiments						
d.	Friends help in science problem						
e.	Feel work well in groups.						

5.	School facilities						
a.	Facility of Girls toilet						
b.	Availability of sanitary pad						
c.	Availability of rest room during ill						

Student's class observation form (For five days)

S.N.	Name of students	Done HW	Done CW	Ask questions with teacher	Reply answer to teacher	Discuss with other friends
1.	A					
2.	B					
3.	C					
4.	D					
5.	E					
6.	F					
7.	G					
8.	H					
9.	I					
10.	J					

Appendix-C

Teacher's Interview Schedule

Name of the school: Age:

Address: Qualification:

Name of the Teacher: Service Duration:

Service Status: Permanent/Temporary/other

1) How do you feel being a science teacher?

…..……

2) Do you think that gender played significant role in science teaching?

……

3) What is the level of interest of students in your class in terms of gender?

……

4) How is the achievement of the students in science in the previous exams?

……

4.1) Who achieve first position in previous exam? (Girl/boy)

……

4.2) How is the achievement of the girls compared to boys?

……

4.3) What are the factors that you think have caused it?

……

5) What chapters in science books of class nine have you found difficult for student?

……

6) Do you find any chapters in science which girls are feel difficult than boys?

……

7) How would you deal with gender perspective in science?

……

8) Do you think that there is any relationship between engagement and achievement of students?

……

8.1) whether girls or boys who get more involved in action?

……

8.2) Do you think that there is equally participate of girls and boys in learning science? Why?

……

8.4) Do you think that there is equally engage of girls and boys in classroom interaction with science subjects?

……

8.5) How can we achieve balance regarding academic achieving among girls and boys students distinct ways of achieving academic lesson in the same class?

……

8.6) Do you think that there is equally engage of girls and boys in practical activities in science?

……

8.7) Which one is do more homework between girls and boys?

……

8.8) How often do you engage your students in problem solving activities?

……

9) What are the main problems you are facing specially in science teaching?

……

10) Lastly, your opinions regarding the betterment of girl's engagement and achievement in secondary science?

……

Appendix-D

Student's Interview Schedule

1) How do you feel being a girl's?

…..……

2) Are you satisfied with your science teacher? Why?

……

3) Which is your interest subject? Why?

……

4) Do you have the access to the science laboratory for the practical classes?

……

5) How your science teacher call you?

……

6) Do your science teacher ask equal number of questions for girls and boys?

……

7) Do your science teacher participate in practical class both boys and girls?

……

8) Does the course of science complete in time?

……

9) Who achieve the first position in previous class?(girl/boy)

……

10) How is the position of the girls compared to boys?

……

11) Why is your achievement found to be less in science?

……

12) Why is your achievement found to be more in science?

……

13) What are the factors that you think have caused it?

……

14) Do you have female friendly toilet in your school?

……

15) Do you have availability of sanitary pad in your school?

……

16) Do you have any good or helping friends in class?

……

17) Do you discuss about the science problem with science teacher?

……

18) What chapters in science books of class nine have you found difficult?

……

19) Do you find any chapters in science are too much interested in?

…….

20) Do you think that there is equally participates of your teacher for girls and boys in learning science? Why?

……

21) Do you think that there is equally engage of girls and boys in make improvisation materials? Why?

……

22) Do you think that there is equally engage of girls and boys in classroom interaction with science subjects?

……

23) Do you think that there is equally engage of girls and boys in practical activities in science?

……

24) How often do engage your science teacher in problem solving activities?

……

25) What are the main problems you are facing specially being a girl?

……

26) Does your science teacher cooperate you in solving these problems?

……

27) Lastly, your opinions regarding the betterment of girl's engagement and achievement in secondary science?

……

Appendix-E

Achievement Test-paper

Class: 9 Date: 2076-02-….

Name of students: Time: 30 minute

Name of school:

Tick ( ) the correct answer.

A. Multiple choice questions (MCQ)

1. What is the SI unit of power?

   a) Newton b) Pascal

   c) Watt d) Joule

2. What is the SI unit of work?

   a) Newton b) Pascal

   c) Watt d) Joule

3. Which of the following is derived unit?

   a) Ampere b) Watt

   c) Candela d) Kelvin

4. Which of the following is fundamental unit?

   a) m/s b) N

   c) Kg d) Kg/m^3

5. Which system is also called metric system?

   a) S I system b) MKS system

   c) CGS system d) FPS system

6. How many fundamental unit are used in measurement?

   a) 2 b) 4

   c) 6 d) 7

7. The displacement per unit time is called-

   a) Acceleration b) Speed

   c) Velocity d) Force

8. What is the unit of density?

   a) m/s b) m/s^2

   c) kg/m^3 d) N/m^2

9. When established SI system?

   a) 1890 b) 1990

   c) 1960 d) 2010

10. One KW is equal to-

    a) 10 W b) 100 W

    c) 1000W d) 10000 W

11. Derived unit is always depend upon-

    a) Area b) Fundamental unit

    c) French unit d) British unit

12. What is the formula of pressure?

    a) Mass/volume b) Displacement/time

    c) Work done/time d) Force/area

13. What is the valenscy of helium?

    a) 0 b) 1

    c) 2 d) 3

14. H_2SO_4 is the chemical formula of -

a) Hydrochloric acid b) Sulphuric acid

c) Nitric acid d) Carbonic acid

15. What part of the atom has a positive charge?

a) Proton b) Electron

c) Neutron d) Shell

16. What is the molecular formula of potassium chlorate?

a) $K_2Cr_2O_7$ b) CH_3COOH

c) KCl d) $KClO_3$

17. How many valence electrons are present in an oxygen atom?

a) 2 b) 6

c) 7 d) 8

18. How many electrons are present in p sub-shell?

a) 2 b) 4

c) 6 d) 8

19. Which of the following is electrovalent compound?

a) HCl b) NH_3

c) NaCl d) CO_2

20. What is the molecular formula of lime stone?

a) $CaSO_4$ b) $CaCO_3$

c) CaO d) MgO

21. Which of the following is covalent compound?

a) MgO b) CaO

c) NaCl d) CO_2

22. How many electrons are contain in K-shell?

a) 1 b) 2

c) 3 d) 4

23. What is the shape of p sub-shell?

a) Circular b) Oval

c) Dumbbell d) Rectangular

24. What is the valency of inert gas?

a) 1 b) 2

c) 0 d) 3

25. Who propounded the five kingdom system of classification?

a) Carolus Linnaeus b) Robert H. Whittaker

c) Sir Isaac Newton d) Robert Hooke

26. Which kingdom are placed under Single cell eukaryotes?

a) Monera b) Protista

c) Fungi d) Animalia

27. Bryophytes are falls under-

a) Kingdom Protista b) Kingdom Fungi

c) Kingdom Animalia d) Kingdom Plantae

28. Non green organisms are falls under-

a) Kingdom Protista b) Kingdom Fungi

c) Kingdom Animalia d) Kingdom Plantae

29. Phylum chordate is classified into-

a) 2 sub-phylum b) 3 sub-phylum

c) 4 sub-phylum d) 5 sub-phylum

30. Which class falls under giving birth to baby?

a) Pisces b) Reptiles

c) Mammalia d) Aves

31. Which division is also called amphibian?

a) Algae b) Fungi

c) Tracheophyta d) Bryophyta

32. Earthworm is falls under phylum-

a) Porifera b) Annelida

c) Molusca d) Arthropoda

33. Spider is falls under phylum-

a) Porifera b) Annelida

c) Molusca d) Arthropoda

34. Snail is falls under phylum-

a) Porifera b) Annelida

c) Molusca d) Arthropoda

35. spongilla is falls under phylum-

a) Porifera b) Annelida

c) Molusca d) Arthropoda

36. How many division are in phylum plantae?

a) 2 b) 3

c) 4 d) 5

37. Which disaster cannot affect for Nepal directly?

a) Land slide b) Cyclone

c) Glacial lake outburst flood d) Earth quake

38. Which disaster is responsible by human?

a) Deforestation b) Volcano

c) Earth quake d) Cyclone

39. Global warming causes-

a) Deforestation b) Volcano

c) Climate change d) Decrease in sea level

40. Which gas is responsible for green house?

a) Hydrogen b) Oxygen

c) Helium d) Carbon dioxide

Appendix-F

Answer key for Achievement Test

1	c	11	b	21	d	31	d
2	d	12	d	22	b	32	b
3	b	13	a	23	c	33	d
4	c	14	b	24	c	34	c
5	b	15	a	25	b	35	a
6	d	16	d	26	b	36	b
7	c	17	b	27	d	37	b
8	c	18	c	28	b	38	a
9	c	19	c	29	c	39	c
10	c	20	b	30	c	40	d

Appendix-G

Class Attendance Table of Girls Students

S.N.	Respondent	School opening days	students attendance day	Percentage
1	A	46	44	95.65
2	B	46	43	93.48
3	C	46	43	93.48
4	D	46	42	91.30
5	E	46	43	93.48
6	F	46	44	95.65
7	G	46	42	91.30
8	H	46	40	86.96
9	I	46	44	95.65
10	J	46	42	91.30
11	K	46	43	93.48
12	L	46	43	93.48
13	M	46	39	84.78
14	N	46	38	82.61
15	O	46	37	80.43
16	P	46	40	86.96
17	Q	46	44	95.65
18	R	46	40	86.96
19	S	46	35	76.09
20	T	46	35	76.09
		Average		89.24

Appendix-H

Interaction Position Table of Girl Students

S.N.	Respondent	Interaction position with teacher	Interaction position with peers	Average Interaction
1	A	100	80	90
2	B	80	80	80
3	C	60	60	60
4	D	80	60	70
5	E	40	60	50
6	F	40	60	50
7	G	60	40	50
8	H	80	60	70
9	I	60	40	50
10	J	60	40	50
11	K	80	60	70
12	L	80	60	70
13	M	60	60	60
14	N	40	60	50
15	O	40	40	40
16	P	40	60	50
17	Q	80	80	80
18	R	40	60	50
19	S	60	60	60
20	T	60	40	50
		Average		60

Appendix-I

Extra activities level Table of Girl Students

S.N.	Respondent	HW	CW	Average
1	A	100	80	90
2	B	80	80	80
3	C	60	80	70
4	D	80	60	70
5	E	60	60	60
6	F	60	60	60
7	G	60	60	60
8	H	40	60	50
9	I	60	60	60
10	J	40	60	50
11	K	80	60	70
12	L	80	80	80
13	M	60	80	70
14	N	60	60	60
15	O	60	40	50
16	P	60	60	60
17	Q	80	80	80
18	R	60	80	70
19	S	60	60	60
20	T	40	60	50
		Average		65

Appendix-J

Achievement Table of Girl Students

S.N.	Respondents	Full mark	Obtained mark	Percentage
1	A	40	36	90
2	B	40	34	85
3	C	40	35	87.5
4	D	40	28	70
5	E	40	24	60
6	F	40	26	65
7	G	40	25	62.5
8	H	40	20	50
9	I	40	27	67.5
10	J	40	19	47.5
11	K	40	23	57.5
12	L	40	27	67.5
13	M	40	24	60
14	N	40	20	50
15	O	40	20	50
16	P	40	29	72.5
17	Q	40	34	85
18	R	40	29	72.5
19	S	40	20	50
20	T	40	18	45
		Average		64.75

Appendix-K

Achievement Table of boy Students

S.N.	Respondents	Full mark	Obtained mark	Percentage
1	I	40	36	90
2	II	40	30	75
3	III	40	28	70
4	IV	40	26	65
5	V	40	24	60
6	VI	40	26	65
7	VII	40	27	67.5
8	VIII	40	26	65
9	IX	40	19	47.5
10	X	40	35	87.5
11	XI	40	22	55
12	XII	40	28	70
13	XIII	40	25	62.5
14	XIV	40	24	60
15	XV	40	27	67.5
16	XVI	40	29	72.5
17	XVII	40	24	60
18	XVIII	40	26	65
19	XIX	40	19	47.5
20	XX	40	20	50
		Average		65.13

Appendix-L

T-test between achievement of girl and boy students table

S.N.	Percentage of girls	Percentage of boys
1	90	90
2	85	75
3	87.5	70
4	70	65
5	60	60
6	65	65
7	62.5	67.5
8	50	65
9	67.5	47.5
10	47.5	87.5
11	57.5	55
12	67.5	70
13	60	62.5
14	50	60
15	50	67.5
16	72.5	72.5
17	85	60
18	72.5	65
19	50	47.5
20	45	50
Average	64.75	65.13
	T-test value	0.4632

Appendix-M

Correlation between Class Attendance and Achievement of Girl Students Table

S.N.	Achievement of girls	Class Attendance of girls
1	90	95.65
2	85	93.48
3	87.5	93.48
4	70	91.30
5	60	93.48
6	65	95.65
7	62.5	91.30
8	50	86.96
9	67.5	95.65
10	47.5	91.30
11	57.5	95.65
12	67.5	93.48
13	60	84.78
14	50	82.61
15	50	80.43
16	72.5	86.96
17	85	95.65
18	72.5	86.96
19	50	76.09
20	45	76.09
Average	64.75	89.35
	Correlation	0.639409982

Appendix-N

Correlation between Classroom Interaction and Achievement of Girl Students Table

S.N.	Achievement of girls	Interaction of girls
1	90	90
2	85	80
3	87.5	60
4	70	70
5	60	50
6	65	50
7	62.5	50
8	50	70
9	67.5	50
10	47.5	50
11	57.5	70
12	67.5	70
13	60	60
14	50	50
15	50	40
16	72.5	50
17	85	80
18	72.5	50
19	50	60
20	45	50
Average	64.75	60
	Correlation	0.591288074

Appendix-O

Correlation between Extra Activities (HW and CW) and Achievement of Girl Students Table

S.N.	Achievement of girls	Extra activities of girls	
1	90	90	
2	85	80	
3	87.5	70	
4	70	70	
5	60	60	
6	65	60	
7	62.5	60	
8	50	50	
9	67.5	60	
10	47.5	50	
11	57.5	70	
12	67.5	80	
13	60	70	
14	50	60	
15	50	50	
16	72.5	60	
17	85	80	
18	72.5	70	
19	50	60	
20	45	50	
Average	64.75	65	
	Correlation		0.81935295

Appendix-P

Correlation between Achievement and Engagement of Girl Students Table

S.N.	Class Attendance of Girls	Interaction of Girls	Extra Activities of Girls	Overall Engagement	Achievement of Girls
1	95.65	90	90	91.9	90
2	93.48	80	80	84.5	85
3	93.48	60	70	74.5	87.5
4	91.30	70	70	77.1	70
5	93.48	50	60	67.8	60
6	95.65	50	60	68.6	65
7	91.30	50	60	67.1	62.5
8	86.96	70	50	69.0	50
9	95.65	50	60	68.6	67.5
10	91.30	50	50	63.8	47.5
11	95.65	70	70	78.6	57.5
12	93.48	70	80	81.2	67.5
13	84.78	60	70	71.6	60
14	82.61	50	60	64.2	50
15	80.43	40	50	56.8	50
16	86.96	50	60	65.7	72.5
17	95.65	80	80	85.2	85
18	86.96	50	70	69.0	72.5
19	76.09	60	60	65.4	50
20	76.09	50	50	58.7	45
Average	89.35	60	65	71.4	64.8
				Correlation	0.782862527

Appendix-Q

Name of the Students Table

S.N.	Name of the girl students	Respondents	Name of the boy students	Respondents
1	Yunisha Raya	A	Sanskrit Paudel	I
2	Tenji Tamang	B	Prasant Timalsina	II
3	Sangmu Sherpa	C	Pradip Lama	III
4	Sarin Bhujel	D	Osis Silwal	IV
5	Rasmi Tamang	E	Sujan Sherchan	V
6	Dibya Raut	F	Digish Paudel	VI
7	Asmita Tamang	G	Ishan Khadka	VII
8	Pratima Thami	H	Sujan Timalsina	VIII
9	Rukmita Newar	I	Ujwal Paudel	IX
10	Devi Newar	J	Roshan Khadka	X
11	Sisam Shrestha	K	Sudip Thapa	XI
12	Preeti Lama	L	Prabin Karki	XII
13	Amrita Lama	M	Dhiraj Tamang	XIII
14	Sabina Nepal	N	Barun Tamang	XIV
15	Sandipa Parajuli	O	Dawa Tamang	XV
16	Shristi Khadka	P	Susant Adhikari	XVI
17	Kristina Tamang	Q	Ronish Karki	XVII
18	Kamana Parajuli	R	Somlal Tamang	XVIII
19	Sandipa Ghimire	S	Bijaya Nepali	XIX
20	Rachana Neupane	T	Rajendra Tamang	XX