

Chapter- I

INTRODUCTION

Background of the Study

Physical disability student is any type of physical condition that significantly impacts one or more major life activities or learning activities. Physical disabilities students can be the result of congenital birth issues, accidental injury or illness. Physical disability is not whether a person has a specific condition but how that physical condition impacts his or her daily life. Mobility, work tolerance, self-care and communication are categories of daily living that tend to be impacted by significant physical disabilities.

A student who is unable to use his parts of body completely, partially because of illness, injury, birth issues etc and unable to learn easily is called a disabled student. In other words, the students who are physically disabled to learn easily also need to be categorized as students. Students with physical disabilities can be doing very well in Mathematics class given the right guidance, teaching strategies and assistive technology. "A physical impairment of students means any physiological disorder or condition, cosmetic disfigurement or anatomical loss affecting one or more of the following body systems: neurological, musculoskeletal, special sense organs, respiratory, cardiovascular, reproductive, digestive and lymphatic, skin and endocrine" (Foster, 2010). Mathematics, which was created to meet human needs, is going ahead with human civilization. Human beings are the most sensible and curious creatures to which mathematics is necessary at every moment of life.

The world of today cannot be more advanced and nobody can live without mathematics. People use mathematics to solve the difficulties that arise due to natural calamities, political purposes, economic

development planning and other social events. In spite, physically disabled students also uses mathematics but the number of physical disabled students is increasing day by day, because of the injury, illness, accident, birth issues as well as heredity due to which, on comparison the physical disabled students can't learn easily like normal students. They need special education with different types of teaching learning materials, training and trained teachers. Nowadays Mathematics is a culture free subject, this statement itself explained courage of willing people and define how they take it, either on positive or negative aspects. So likewise here we deal about learning of mathematics subject by other of two kinds i.e. physically disabled and those healthy. It is obvious than one who is healthy and mentally fit can learn better but even disabilities students can learn best on mathematics if they are provided with proper care, facilities, training etc. Though mathematics a part of calculus; is daily requirement for every individual. No one can be far away from it; even single. It shows great importance of mathematics to every individual i.e. disabled and healthy. So various facilities of course structure, location, classroom dynamic, family support, school environment etc. Should be favored them well.

The constitution of Nepal defines a disabled person as one who is mentally or physically unable to lead a normal life. Similarly, the World Health Organization's (WHO) definition of disability denotes impairments, activity limitations and participation restrictions. The term includes persons whose mobility is limited and those with hearing and visual impairments. Disability is defined as any restriction or lack (as result of any impairment) of ability to perform an activity in the manner or with the range considered normal for the human being (Lennard, 1997). The 2011 Census Report of Nepal (CRN) has classified disability into seven distinct groups. Which are physical disability, vision- related disability, hearing related disability, multiple disabilities, deaf-blind disability, voice and speech-related disability and

mental disability. The physical disability is defined as partial or total loss of physical operational abilities, problems with the use and movement of nerves or muscles and complications with the composition and, or operation of bones and joints including amputation, arthritis and cerebral palsy. There are two types of physical disabled i.e. Paraplegia and Quadriplegia. Paraplegia results from injury to the spinal cord, occurring below the neck, while quadriplegia refers to damage to the spinal cord in the neck. Varying degrees of loss of limb and other mobility may result from either condition. Other forms of physical disability, such as polio (an acquired disease), cerebral palsy (damage to brain tissue during fetal stages) and some genetic conditions can result in loss of mobility. Other than Paraplegia and Quadriplegia the physical disabilities are Multiple sclerosis (MS), Hemiplegia Cerebral palsy, Absent limb/reduced limb function, Dystrophy Polio (NEADS).

The physically challenged students have some needs that arise from their relationship with the teachers as well as their peer group, and that when their social needs are not met; the challenged students become disappointed, unhappy and anti-social. Hence, lack of social support, non acceptance, prejudice and devaluation faced by the challenged students compounds their problems. It was further observed that, the physically challenged students have not been given special attention and proper care rightly deserved. According to Racheal (2017), physically disable student have mainly the challenge in the area of admission, access to facilities in the classroom, transportation and hostel accommodation.

Disabled students are students with some physical or mental impairment that substantially limits one or more major life activities. Usually physical disabled students have low academic achievement. Many students with disabilities have difficulty remembering information presented visually or auditorially. Most of these students forget spelling words, math facts,

vocabulary words, and directions. Physical disabled students have attention problems. They are unable to screen out extraneous stimuli and are attracted by irrelevant stimuli. Difficulties with social skills can be as debilitating as academic problems to students with disabilities. Frustrated by their learning difficulties, many students with disabilities act disruptively and acquire negative feelings of self-worth. Rather than learning and developing attitudes about tasks they can do, youngsters with disabilities often learn what they can't do. This lack of positive self-regard often results in poor self-concept and self-esteem (<https://definitions.uslegal.com/d/disabled-students/>).

A physical disability is one that affects a person's mobility or dexterity. A person with a physical disability may need to use some sort of equipment for assistance with mobility. It also includes people who have lost limbs or who, because of the shape of their body, require slight adaptations to be made to enable them to participate fully in society.

Nepal government has made mathematics as a compulsory subject and optional even in secondary level. All the students including physically disabled and normal should be taught about this subject. Method of teaching may be different according to this situation and the nature of the students. Physical disabled students have also their own needs and desires like normal students. So, these students are inspired to go school and receive their education. But people behave differently with disabled students in comparisons to the normal students in our society. It is said that it is the result to evil work of former birth. Because of this concept physical disabled students are always dominated which leads them back than normal students. These kinds of behave and behaviors are completely wrong. It is the result for evil work of neither former birth nor the punishment of god. But, it is the result of malnutrition, carelessness of their parents and lack of knowledge. According the fundamental right in constitution of Nepal "The physically

impaired person and citizen who are financially poor shall have the right to free higher education as provided for law (Constitution of Nepal,2072)".

All students can learn mathematics and they deserve the opportunity to do so. However recognizing the diversity among children, educators do not expect all students to learn the material in the same manner, using the same resources and in the same time frame. The mathematics classroom focuses the students on individual inclusion for studies, education engagement and education plane is performance in mathematics classroom(Sutton&Kruder, 2015).

Statement of the Problem

The study will be concerned with the Challenge face by physically disabled students while learning mathematics. The general class of school is not sufficient for the disabled and they need extra classes and alternative materials and methods. Generally, many people feel that disabled students are unable to learn mathematics than the normal students. Also it is more challenge to find physical disabled students study mathematics in higher level. Comparatively the achievement of physical disabled students is very low or high or satisfactory in mathematics than the normal students. Therefore, there arise different questions related to mathematics and disabled students, such as do they feel difficult in mathematics because of their disabilities. The physical disabled students feel more difficulty such as content, using material, teaching learning strategies, classroom practice. School infrastructures, classroom inclusive and classparticipation, exam writing, teaching method are the area of challenge physically disabled students. Therefore, the study well be proposed to seek the answer to the following research question.

- What are the areas of challenge of physically disabled students in learning mathematics?

- Why do the physically disabled students feel more challenge in learning mathematics?

Significant of the Study

Mathematics is an essential part of the school curriculum. So every students study it as a compulsory subject at secondary level. Due to this reason the researcher was really interested to study "challenged faced by physically disabled students in learning mathematics" the following were the significance of this study.

- It would be helpful for the school mathematics teachers and parents to evaluate the problem of their physical disabled students.
- It would be helpful for the betterment of new teaching learning activities and new curriculum.
- It would be helpful for the build infrastructure in mathematics classroom.
- It would be helpful for the access and inclusion the physical disabled student to learn the mathematics.
- The study would help physical disabled students to gain better achievement as normal students gain.

Objective of the Study

All research studies have their own objectives. In this sense this current study is not an exception. The broad objectives of this study are, to show the condition of physically disabled students in mathematics and their difficulty in learning mathematics. The objectives of the research were as follows:

- To find the areas of challenges in learning mathematics of physically disabled students.

- To find the causes of challenge to physically disabled students in learning mathematics.

Delimitation of the Study

Any study cannot overcome the entire field: i.e. each of them has some limitations. This study also had some limitations, which are listed as follows:

- The study was limited in Kathmandu district.
- The study was limited to only secondary level (only grade 10).
- The study included only the government school of Kathmandu district.
- The study was only limited to challenge faced by physically disabled students while learning mathematics.

Definition of the Related Terms

Specially Trained Teacher : In this study specially trained teacher means those teachers who have got special training about disabled and other academic training from any government or non-government institutes.

Trained Teacher: Trained teacher means those who have got any type of training related to academic field at least six month.

Untrained Teachers: The remaining are categorized as untrained teacher for the purpose of this study.

Integrated Schools: Those school, which are running under the financial support of Ministry of Education and other non- government organizations in which the physically disabled students are

studying along with other, physically normal students. The education takes from these types of school is called integrated education.

Learning : A more or less permanent changes in behavior, which occurs as a result of instruction and practice.

Learning Challenges: Learning challenge is a general term which refers to children or students who experience difficulties with their learning.

Chapter-II

REVIEW OF THE RELATED LITERATURE

Review of related literature is called a deep insight and clear prospective of the overall field. The main purpose of review of related literature is to find out what works have been done in the area of the research problem under study and what has done in the field of the research study being under taken.

Theoretical Literature

Vygotsky's Theory of Learning

The theme of Vygotsky's works is that a learner's cognitive development takes place in a social context. Throughout their lives learners are surrounded by the parents, sibling, relative friends, teachers and fellow students. they communicate with one another and stimulate . Parents and teachers in particular are more knowledgeable and skilled than learners. Learners acquire knowledge and about their culture and history from their encounters with adults, peers and the media. This cultural knowledge includes shared beliefs, ways of viewing the world, patterns of interacting with people and language.

Thus the cognitive development is a child's increasing mastery over the culturally determined developmental tasks imposed by social agents. Therefore, part of the development of children's thinking requires apprenticeship into culturally specific cognitive and social practices. According to Vygotsky, cognitive development does not happen just in the head of the child. Rather, it is a process of learning to operate with physical, symbolic and cognitive processes. The difference between a child's individual performance and that child's performance when

guided by experts in metaphorically described by Vygotsky's Zone of Proximal Development (ZPD). In this ZPD be a learner, although not capable of solving problems independently, can do so with help of others. The ZPD was described by Vygotsky (1978) as:

When it was first shown that the capability of children with equal levels of mental development to learn under a teacher's guidance varied to a high degree, it became apparent that those children were not mentally the same age and that the subsequent course of their learning would obviously be different. This difference between twelve and eight or between nine and eight, is what we call the zone of proximal development problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Pradan, 2015). Thus the principal theme of Vygotsky's theory is that a learner's cognitive development takes places in a social context. Social- cultural theory emphasizes that the most advantageous learning environment is one where a dynamic interaction with others. Atherton (2005) emphasizes that in a social-cultural classroom, learners to gain meaningful understanding of the learning material.

The concept of scaffolding is closely related to the ZPD, although Vygotsky himself never mentioned the tern, instead, scaffolding was developed by other socio-cultural theorists applying Vygotsky's ZPD to educational contexts. Scaffolding is a process through which a teacher or more competent peer gives aid to the student in her/ his ZPD as necessary, much as a scaffold is moved from a building during construction. According to Balaban (1995), "scaffolding is refers to the way the adult guides the childs's learning focused questions and positive interactions". Scaffolding is the process in which the student masters a skill under the guidance of an expect. There are four basic steps in the process as follows.

- The student observes the teacher modeling an activity.
- The student tries the activity under guidance of the teacher.
- The teacher prompts with cues only when needed.
- The student is free to practice the skill independently.

Implications of Vygotsky's Learning Theory in classroom

Mathematics generally, learning theory is a guide line for effective teaching learning activities. It helps to the teacher about the nature of learning, learning method, teaching material teaching learning strategies, evaluation process and individual process and individual differences, etc.

The ZPD theory has significant implications in teaching and learning in the mathematics classroom. Regarding the use Vygotsky's theory in the mathematics classroom. He recommends two approaches. First aspect is the use of assisted instruction which is quite common for the teachers to give students a lot of mathematical tasks as homework, without considering the sort of assistance that is available to the learner. According to Vygotsky (1978), Problem solving should be under the guidance of a competent or capable peer. Mathematics could be an enjoyable subject if there is expert intervention and timorously rendered.

Vygotsky considers that collaboration is another crucial aspect for mathematics instruction. For this, teachers should identify capable students in the class. Those who have low capacity for mathematical mastery should be assisted by the capable peers. Teachers should be convinced that the capable peers possess the mathematics ability before they are allowed to assist others. The more expert partner should provides support at the moments where maturing

functions are inadequate. It is important to understand that learner is able to perform a certain tasks alone, while in collaboration, is able to perform a greater number of tasks (Pradan. 2015).

The teacher of mathematics considers individual zones of proximal development of learner. Teaching each learner mathematics according to his/her ZPD, has two major advantages. The tasks are made simpler for the learner and the learner's intellectual ability to deal with the tasks is considered. Teaching within the ZPD implies providing mathematical activities that are of appropriate difficulty as measured by the mistakes that students make while trying to come through in a process that should be higher than zero for a student to learn. However, the tasks assigned to the learners in mathematics, sometimes fall outside the ZPD that the learner can already do, or tasks that the learner would not be able to do even with help. Theory implies that the challenge for all teachers is to support this development is through scaffolding, which involves structuring the ideas to be understood in an order that is likely to lead children to develop further and faster than would on their own . In mathematics learning for example, a student may know a formula but may fail to apply it. With the assistance of the knowledgeable teacher or capable peers, the students learn to apply the formula.

This study about the mathematics learning difficulties of physically disabled students is based on school society. Society is the place where people are leaving together with good co-operation among all the cultural diverse groups. Society plays vital role to develop the knowledge of students. However, students mind like blank sheet of paper in which knowledge can be filled which desired by school society/simply society. Society teaches the various type of knowledge to the students by different approach. These approaches are based can on society, social culture, social group, and ethnicity. Students construct the knowledge according to their language, culture, ethnic groups which are also the main theme of social constructivism.

Vygotsky's theory says that knowledge is constructed socially. To construct the knowledge there must be interaction in the society in which ZPD, scaffolding, peer interaction, class participation and collaboration play vital role to learn mathematics.

From the above literatures, the researcher had taken following hints.

- Social constructivist teaching approach is one the most useful and practical method.
- ZPD is used to teach the mathematics physically disabled students in which find the gap between the knowledge learnt by physically students independently and with the help of mathematics teacher.
- Scaffolding is used to learn mathematics in which physically disabled students are scaffold by the mathematics teacher.
- Collaboration is used to learn mathematics in which physically disabled students collaborate in the groups inside the classroom and outside the classroom.
- Social constructivist theory is focuses in the subjective aspects rather than objective aspect of subjective matter.

Finally, social constructivism focuses that the knowledge is based on pre-knowledge, pre- experience and capacity of students as well as social interaction and also focused on student's center teaching method and main role of learning language, so teaching medium should be family language. Every student can read mathematics so that mathematics is for all.

Bruner Learning Theory

A major theme in the theoretical framework of Bruner is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and make decisions, relying on a cognitive structure to do so. Cognitive structure (i.e. scheme, mental models) provides meaning and organization to experiences and allows the individual to "go in beyond the information given".

Bruner thinks that the process of education is more important than the product. In this process of learning students focus on, how to learn?, what way to learn?, rather than what to learn? Bruner (1966) states a theory of instruction should address four major aspect is pre-disposition towards learning, structure of knowledge, sequence, reinforcement explains as follow:

- **pre- disposition towards learning:**

Every education learning principle must include the appropriate subjective and year of excellence education learning system from the beginning of schooling stage of individual student.

- **Structure of knowledge:**

Every education learning principle must focus on well package of education so that student can gain it conveniently.

- **Sequence:**

Every education learning principle must hold opinion of mathematics presentation in appropriate and systematic manner.

- **Reinforcement:**

Every education learning principle must agree on point of sharing the prize to among the most effective and the one who contain knowledge in depth.

Bruner describes the general learning process in the manner. First the child finds in his manipulation of the materials regularities that correspond with intuitive regularities it has already come to understand. According to Bruner the child finds some sort of match between what it is doing in the outside world and some models or templates that it has already grasped intellectually. For Bruner it is seldom some time outside the learner that is discovered. Instead, the discovery involves internal reorganization of previously known ideas in order to establish a better fit between those ideas and regularities of an encounter to which learner has had to accommodate.

According to Bruner, learning is an active process; here learner builds new concepts or process from their recent learning knowledge. Bruner has indicated about the child mental development nature and features while learning. These intellectual development nature and features bring relation with learning process. The learning will be better if a teaching tasks information about child intellectual development nature and its features. To summarize Bruner's principles, the enactive, the iconic and the symbolic are the conditions in series:

- **Enactive Mode:** In this mode, it contents learning that we learn from direct sight doing or from its use. There is low use of word. Learning to ride cycle is its example learning through action is its main feature, (Acharya 2072)
- **Iconic Mode:** In this phase, there come the learning that a child learns from seeing/watching film photos, art etc. is its example. During learning a child uses mental image from one

concept like while taking three dimensional axis, child imagine a box and compare with its length breadth and height,(Acharya,2072).

- Symbolic mode: In this mode and individual use internal symbol to learn realities. At last the children learn by transformation of experience into the words. Like, while calculating value of simultaneous equation they transfer x and y variable and find the solution,(Acharya,2072).

In order them to identify factors involved in teaching and learning mathematics, Bruner and his friends have observed a large number of mathematics classes and conducted experiments on teaching and learning mathematics. As a consequence if these observation and experiments, Bruner and Kenney formulated four general theorem as given follows (Bruner, 1966).

- Construction Theorem: The construction theorem indicates that the best way for a student to begin to learn a mathematical concept, Principal, or rule is by construction a representation of it.
- Notation Theorem: The notation theorem states that early constructions of representation can be made cognitively simpler and can be better understood by students if they contain notational which is appropriate for the students have of mental development.
- Contrast and Variation Theorem: Mathematical concepts are abstract. In teaching learning process this abstractness of mathematics of mathematics can be made concrete representation involve the operation of contrast and variation process (Bell,1978). While teaching even number there should be knowledge of odd number. While teaching square root should be knowledge of the square .
- Connectivity Theorem: The connectivity theorem states that each concept, principle, and skill in mathematics is connected to other concept, principles or skills. The structure

connections among the elements in each branch of mathematics permit analytic and synthetic mathematical reasoning as well as intuitive jumps in mathematical thought.

Implication of Bruner's Theory in Teaching

In teaching we can use Bruner's learning theory; there should be the presentation of subject matter/structure by spiral organization according to the child condition. There is relationship among mathematical concept, so, while teaching one subject equivalent example should be given of another subject. There is main role of teacher to bring readiness in child. There should be creation suitable environment from use of instructional materials. There is the remembering works of children from object so, at first the teaching should be done from use of concrete object. Likewise, at second step, semi concrete and at last from abstract step, continuously the teaching has to be conducted. The base of evaluation is not only paper pencil test, there should be search of other alternative method of evaluation, like interview, observation and project work. From the interaction of teacher-student, student-student there is development of understanding of subject so, there should be maximum use of it in teaching learning process. This interaction there should be development of things that we see from internal knowledge, finding of beliefs by modification.

Bruner theory is related to this study. Bruner thinks that the process of education is more important than the product. To learn mathematics, process is important for physical disabled students because the process shows the direction of the result. Learning is an active process; learner builds the knowledge with active participation. The knowledge is based on the principal which are pre-disposition, sequence, reinforcement etc. according to burner learning should be in whole to part; there should be the presentation of subject matter/structure by spiral

organization content. According to the student condition, there must be relationship among mathematical concept, example. There should be good interaction among students and teacher as well as Bruner belief that student can learn it their cognitive structure is very well.

Manipulate material should be used in the teaching learning mathematics.

Finally, Bruner theory suggests that process is great in learning mathematics. So to obtain the accurate process reinforcement, motivation should be provided to the physically disabled students which are also very essential elements to learn mathematics for physically disabled students.

Empirical Literature

Hussain, et.al,(2011) studied on "Problem faced by physical handicapped students in education institutions". The purpose of that study was to explore the problems faced by physical handicapped students in normal educational institutions and to find solutions to the problem faced by physical handicapped students. All the physical handicapped students studying in educational institutions in district kohat in Pakistan constituted the population of the study. The study was delimited to the physical handicapped students studying in 20 general educational institutions at four levels; i.e. Elementary, secondary, higher secondary and higher education. Forty students, both male and female, were selected from 20 educational institutions using a random sampling technique. A questionnaire was constructed using the problems faced by physically handicapped students. The results of the investigation revealed that the physically handicapped children constitute 2-3% of the population and the majority of them are lame.

Hanich,et.al,(2001) worked on "Performance across different areas of mathematical cognition in children with learning difficulties". The performance of 210, 2nd grader in different

areas of mathematical cognition was examined. Children were divided into four achievement groups. Children with difficulties in mathematics but not in reading (MD-Only), Children with difficulties in both mathematics and reading (MD/ RD), children with difficulties in reading but not in mathematics and children normal achievement. Although both MD groups performed worse than normally achieving groups in most areas of mathematical cognition. The MD- only group showed an advantage over the MD/RD groups in exact calculation of arithmetics combinations and in problem solving. The two groups did not differ in approximate mathematics and understanding of place value and written combination. Children with MD- only seem to be superior children with MD/RD in areas that may be mediated by language but not in ones that really rely on numerical magnitudes, visuospatial processing and automaticity.

Yadav(2014) researched on "Mathematics learning problems of disabled students". the main objective of this study difficulties and causes of difficulties in learning mathematics of disabled students. This is a case study which is qualitative nature. This study included four disabled students. This study was conducted with the sample of disabled students of grade IV and V selected from the Shree Mandapur, Jumuniya, Binagra Higher secondary School- MadanpurSarlahi chosen purposively. Face to face interview were taken with students, parents, mathematics teacher and Head teacher. The research concluded that, disabled students are unable to approach the school due to poor economic condition, lack of proper environment and discrimination at home and school.

Adhikari(2010) did a study on "The problem faced by blind students in learning geometry at secondary level". The main objectives of this study to investigate the main geometrical problems faced by blind/visually handicapped students. This study also focused to identify the area of the difficulties in the content of geometry for blind students. The research was conducted

case study design and descriptive method was used to interpret the obtained information. This study was conducted with the sample selected from Namuna Machindra Boarding School, Namuna Mahendra Higher Secondary School, Lagankhel, Lalitpur and laboratory Higher Secondary School, Kirtipur. The conclusion of this study is mainly lack of Braille Script and special trained teacher, problem school environment and lack of regularity in school. The research concludes that the following are the major difficulties faced by blind students in learning geometry.

- To develop clear concept in geometrical shape and figures.
- To writing and solving process of mathematical problem in Braille script.
- To adjust in integrated class in learning mathematics .
- On using materials and methods.

Pangali(2012) researched on "Difficulties in learning arithmetic content at grade IX students". The main objective of this study to identify the difficulties and its causes in learning arithmetic in grade IX students. This is a case study based on qualitative nature data directly collection from field and it is qualitative research as well as descriptive. The researcher selected one school from Surkhet district by purposive sampling, which is Shree Nepal Rastriya Higher secondary School, Koraikhola, Surkhet. Researcher selected the respondents of grade IX students, Mathematics teacher and Head teacher. Five students were selected as the respondent for the interview. The researcher is taken face to face interview with students and mathematics teacher and head teacher for identifying the learning difficulties. Learning arithmetic difficulties are not only due to their problems but due to the lack of supportive environment such as teaching methods, instructional materials, students will and motivation, social interaction and their place in the family and society etc.

Yadav(2017) researched on "Difficulties faced by Dalit Students in learning mathematics". The main objective of this study is to analyze the causes of difficulties faced by Dalit students in learning mathematics. In particular, the study attempts to explore these difficulties through the analysis of the causes. This research is qualitative in design with case study approach. For the analysis of the study, the researcher selected three schools of Nawalparasi district, from where 5 Dalit students were sampled. Classroom observation form and interview guidelines to students, subject teacher and parents were used to collect data. In conclusion, the research finds that the guardians and parents of the Dalit students have not regularly kept a close watch on their children's study at home as in the school.

Acharya(2016)'s entitled "The study on inclusive mathematics classroom practices in schools of Arghkhachi District". The main purpose of this research was to identify the situation of mathematics classroom practices in Nepalese schools from inclusive perspective. This study included the classroom teaching-learning situation in the schools is observed on the basis of the classroom episodes. Classroom practices were observed in two schools of Arghkhachi District to achieve the research objective and give the answer of the research questions. It was found that theoretically, teachers have some knowledge about child-friendly learning environment and child-centered pedagogy but unfortunately, it is not being implemented well in the actual mathematics classroom. Principally, inclusive classroom welcomes all learners without any discrimination and a teacher who is teaching in inclusive classroom always respects learner's interests and demands. It also accepts that every student has his/her their unique quality and character. A noticeable observation in the classroom is the big gap between theory and practice of inclusive education. Classroom practices are not being developed according to the demand of inclusiveness.

NPAD (2006) has included the main problem although there is provision for free education for people with disability in disabled protection and welfare 2039 and regulation 2051, education act 2028 and regulation 2059, children with multiple disability have not received the opportunity to study in a convenient and free manner (being able to study in a school convenient from home). In addition, the education of children with disability has not yet been favorable to disability as expected. This study included the policy will be adopted to provide quality free education to people with disability from pre-primary and nursery level to high level. The main strategy of this studied inclusive education program and opportunity to study in a school close to home will be provided from children with disability by preparing infrastructures favorable to disability in primary schools. Adequate provisions will be made for appropriate and necessary textbooks, education materials, assistance materials, assistants.

Fourth (1994) worked on "Research with deaf implication for language and cognition". This reported that disabled and normal students have equal intellectual ability which is the first investigation. Furth tested children on their ability to compare the concept of symmetry, sameness and opposites. He also found hearing impaired and concluded that the cognitive abilities of deaf children are essentially unpaired expected in those case in which the particular concept is very dependent upon language experience. He believes that the occurrence of language dependent concept is low enough that overall cognitive development need not be retarded in deaf children. In addition further stress that deaf children perform worse than normal intellectual test. It may be because they not received attribute parental stimulation of educational instruction

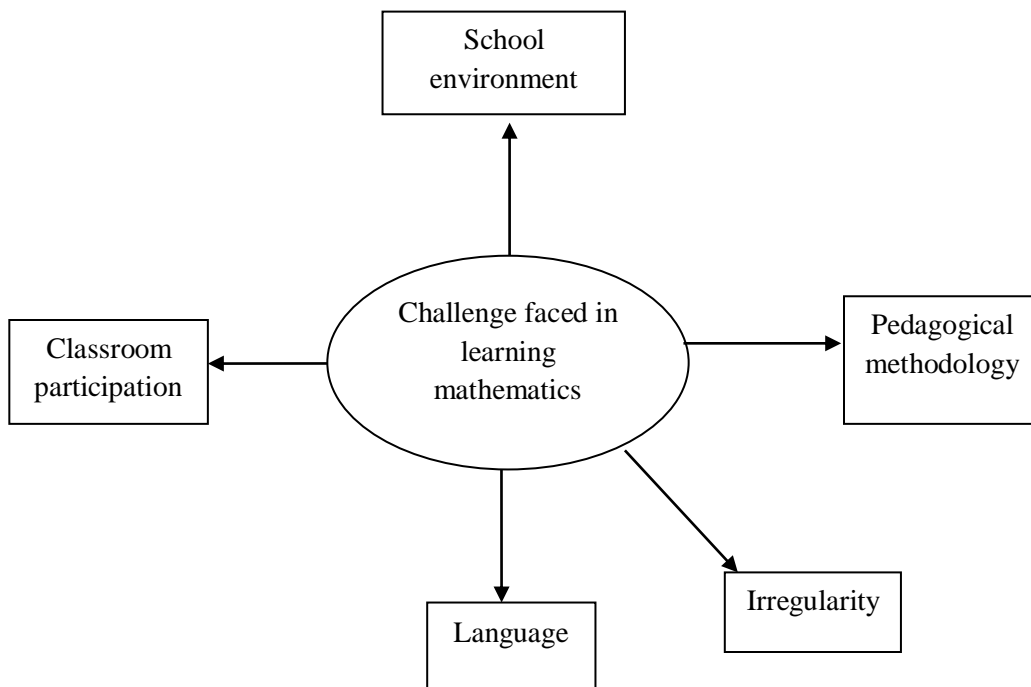
Most of the above researcher focused on mathematics learning difficulties and mathematics reading difficulties of handicapped students , blind students, deaf students in

elementary, secondary and higher secondary level as well as some of them researched in learning difficulties geometry, arithmetic and some have done in inclusive mathematics classroom practices. However many researcher, they had researched in field of disable student but this research is different than stated above research because this research focuses on the secondary level mathematics difficulties, school environment, language, classroom participation, administrative policy in school and based on in-depth interview with physical disabled student as well as it focuses on the physical infrastructure in school, which is one the affecting factor in learning mathematics for the physical disabled students. Which shows that this research is really different than above research. With main objective of drawing of the areas and causes challenged by physically disabled students while learning mathematics. This study will be the qualitative type in which the researcher use case study as well as descriptive method.

Conceptual Framework of the study

This case study sought to draw the challenge face by physically disabled students while learning mathematics. This case study is mainly base upon data analysis & interpretation of the result. The following framework in challenge faced in while learning mathematics is drawn from the above theoretical review and empirical review of the related literature which is purpose as a conceptual framework of this study.

Conceptual Framework



Conceptual framework of the study aforementioned above showed the challenges faced in learning mathematics for the physically disabled students. According to the above tools, Does physical disabled students have challenge or not? By finding these challenges, researcher found their difficulties.

This conceptual frame work describes about the physical disabled student that there discontinuity between their everyday life and school activities, as their practical knowledge in home and theoretical knowledge at school. Infrastructure, language, environment, classroom participation and learning environment within the school environment are the main components of this study. These all components played vital role in learning mathematics. This study supported the physical disabled students, who get area and cause of challenge mathematics learning at secondary level. The school infrastructure is major component which hold's physical disabled students, classroom environment and student's participation for effective mathematics learning. Here, classroom participation refers to the sharing co-operation and participation on learning activities and language refers to the misunderstanding between language and communication. Similarly, irregularity means irregular attendance of physical disabled students in classroom which results to the gap in learning mathematics. Like this way, pedagogical methodology mainly focused on teaching method and child-friendly mathematical learning environment.

Chapter- III

RESEARCH METHODS AND PROCEDURES

This chapter presents the procedure of the study which carried out to achieve objective of the study and to get the answer of the statements of the problems. The research was focused on "Challenge face by physically disabled students while learning mathematics". This study of the qualitative type in which the researcher uses case study as well as descriptive method

Design of the Study

This is the case study related to the difficulties and causes of challenges faced by physically disabled students while learning mathematics, where the case is the secondary level. This study was based on qualitative data that especially concerned with the exploring meaning and the way people understand. Since the design of the research has explanatory case study on which meaning drive from the total picture, logic, and reasoning of why it would like that, how linking with theories and propositions. This case study was viewing the reality the interaction in challenge of mathematics learning in case school with students and teacher.

Selection of Respondent

The respondents of this case study were physically disabled students, head teachers and mathematics teacher of select purposively which helps for researcher to find real educational and physical conditional of physically disabled students. The sample units were selected purposively. The sample size of the inquiry depended upon the researcher what he/she wants to know, what the purpose of the enquiry, what the credibility of the study and what can be done with available time and researcher. This study was qualitative research. Four physically disabled students were

selected as the respondents for the interview from the secondary level. The physically disabled students of secondary level school in Kathmandu district, mathematics teacher and head teacher were selected for interviews were selected by the researcher convenience.

Sample and Sampling

This study was based on qualitative research. So the sample size of this study was not fixed. According to Anderson, there are no rules for sample size in qualitative inquiry. Researcher selected one government school in Kathmandu from four physically disabled students, mathematics teacher and head teacher. Among them two were boys and two were girls students, were selected by purposive sampling and the respondents were also selected by purposive sampling. Moreover, researcher discussed with other students and teachers as available and needs.

Tools for Research

This is a case study, which is in qualitative nature so that the researcher had collected data only by the primary sources and analyzed with the help of literatures. In this study following tools were used.

Observation

As a data gathering device, direct observation makes an important contribution to descriptive method. Researcher observed the students participation in learning in his research duration for identifying the challenges. The observation was used for the student's participation in learning mathematics, teacher-students interaction in classroom, student's participation in group, class work, homework, student's attendance and teaching strategy. The observation of the

study had taken on the basis of factors like observation, listening and interaction for the essential data from the informants using the observation tool. In addition of class- observation, four students were selected for in-depth interview purposively. The model of predetermine observation form was given Appendix.

In- Depth Interview

In this research, the researcher used in-depth interview with the respondents. The researcher had taken the interview on the basis of the objectives i.e. finding out the challenges area while learning mathematics. The interview was designed on the basis of Pedagogical methodology, language difficulty, attention difficulty, infrastructure challenge and irregularity etc. Researcher constructed four interviews schedule formats in semi-structure form and take interview with physical disabled students, mathematics teacher and head teacher. Interview had taken with purposively selected students in classroom which helps the researcher to draw the actual information about challenges of mathematics. Information from teacher, students and head teacher helped the researcher to make conclusion. The interview guideline was formed separately for students, mathematics teacher and head teacher. The interview guideline was given separately in Appendix.

Quality Standard

Quality standard refers to how a test measures, why it is purposed to measure. Quality standard of the research tools was determined with the help of related theory and suggestion of subject expert. To determine the quality of research tools the in-depth interview was taken over a period of time with the selected samples. The frequent class observation was done to check the consistency of the method and procedures used in classroom. The school documents were

gathered and noted for the trust-worthiness. Furthermore, cross match had been adopted to maintain the trust of the study. The researcher also tried to ensure the internal quality standard by observing the same data on the basis theoretical framework developed by the researcher in previous section. The Quality standard of this case study was maintained through cross matching or triangulation.

Data Collection Procedure

The researcher went to school with tools to collect the qualitative data. Researcher had taken class observation while mathematics teacher attaching behaviorally with physically disabled students. I collected data carefully with record and every notable activities of physically disabled students in the observation from. Researcher also had taken interview with head teacher, mathematics teacher, physically disabled students of a case student with the help of guidance of semi-structure interview format.

Data Analysis and Interpretation

Data interpretation is the systematic process of presenting and showing its effect. The analysis of data is important thing while we are preparing research report. In this study primary data had been taken, presented and analyzed. The collected data from primary source by interview and observation were analyzed and interpreted by using descriptive method.

To find out the challenges faced in mathematics learning, all information were collected from primary sources and matched with information from reviewed documents. The data were collected by interview and observation with physically disabled students, mathematics teacher and head teacher. The collected information at first was categorized according to the category of the responses and different themes were given the text of in-depth interview and

observation note. These themes were considered as a code and the similar code version of respondent class of student's were collected together and explain in their perspectives. The collected data were analyzed by cross match approaches. Then, the related themes were analyzed from interview observation and literature review.

Chapter-IV

ANALYSIS AND INTERPRETATION DATA

This is a case study related the challenges faced by physically disabled students while learning mathematics at secondary level of Kathmandu district. The main objectives of this study was to find the areas of challenges while learning mathematics of physically disabled students and to find the causes of challenge to physically disabled students while learning mathematics. Interview schedule of students (Appendix- A), Mathematics teacher (Appendix-B), interview schedule of head teacher(Appendix-C) and observation form of participation (Appendix-D) in class. The main respondents of this study were focused , Head teacher, Mathematics teacher of grade X of the school. Only one school was chosen for this study by purposively.

This chapter deals with the analysis and interpretation of the collected information data were categorized according the category of respondents and different themes were given in text view or the observation note. The obtained study is presented in terms of the following topic.

- School Environment
- Language
- Irregularity
- Pedagogical methodology
- Classroom participation

These themes were considered as a code and the similar code version of responds were collected together and explained in their perspectives. The school environment and other details were obtained by observing document analysis of the school.

Respondent A

Respondent A was 16 years old boy studying at grade 10. He lived in Kathmandu Makhalbari ward -5. It took about twenty seven minutes to reach school from the hostel. He had seven members in his family. He had very weak economic condition. He used to feel difficult to go school from the hostel due to problem of his spinal cord. He usually used to be absent in school. The researcher just talked about learning difficulties in mathematics. Everyday life was one of the components of the discrimination. Participation, observation in the field of the researches come to know, physically disabled students had silence at classroom for example he used friendly language in his class. "*Sir le bhaneko bujheyann maile ferivannuhunnara*". The teacher did not like language, teacher aspect respective language. Due to his language he could not ask any question to the teacher and could not understand any mathematics problem.

The answer that researcher got after asking the question about classroom environment to his student, "*Merolagikashyako thaupauktachhaina kina bhane ma wheel chair prayoggarne physically disabled student hutasarthakashya ma wheel chair ghumaunamildainajaslemalai class room activity ma samasyautpannahunchhajaslegardaganitpadaitiradhyanjadaina*."

Similarly the researcher asked the question about pedagogical methodology to his student. "*sir le sadhaie autaidhibatapadaunuhunchha, arkobidhi le padaunu sir bhandatimiharumaile padhayekosamayae ma lekhnasakdhainaubhannuhunchha . hamilai mathskolagichhutyayekosamayeko le pugdainajaslehamilaiganitsikaimabadhapuryauchharathapsamayeraaru teaching method bata sir le padaunuhudainajaslehamilaiganitkodharanabughnagarohunchha* ".

From this classroom observation, A is found fully helplessness not only from classroom as well as from school environment. In addition, being mile away from parents it become greatest problem for him, which brings hindrance in learning mathematics.

Respondent –B

Respondent-B was twenty years old boy, studying in grade 10 at Khagendra New life Special education foundation (Jorpati, Kathmandu). He was born at Dailekh, Madanpurrural municipality-4 but at present, he is living in hostel (Kathmandu , Jorpati -9). There were altogether six family members in his family; father a farmer and mother a housewife and his economic condition was poor. He went to school on foot with his artificial legs, it took 20 minutes to reach school from his hostel .As he was one of the victim of earthquake where he lost his both legs.

From this research, it seemed that his family was poor in economic condition as well as uneducated. Though, he was physically disable student, but he was good in swimming and study. He had participated in many national and international swimming competitions. He said, "*mathematics malaisabaibhanda man parne subject ho taramalai classroom activities ra participation hunsarhaigaryohunchha*". However, he was so interest in the mathematic as well as he was hardworking students but due to lack of support of his guardian being far away and his physical disability could not perform well in mathematics. He was not going regularly school because of his disability and swimming player.

The answer that researcher got after asking the question about classroom environment to his student, "*classroom ma desk ra bench aapangamaâtrichhaainaraaafulai bench ma basnaraniskanaaapthyarohunchha kina bhane ma artificial khuttabhako aapangabhako student*

hujaskokaran le teaching activity , classroom participate garnasakdina

.parinamsworumsochejati mathematics practice garnasakdina ." , Similarly the researcher asked the question about pedagogical methodology to his student, "*teaching material prayoggarerakahilepadaunubhakochhainarakashyakotha teaching material parayoggarnaanukul environment chhaina , yedi teaching material prayoggakobhaye mathematics prayoggarnasakjilohuntheyoki ."*

From this classroom observation, the desk and benches are found to be donated which are not disabled student friendly and even mathematics teachers do not use the teaching material as per available so , if he had used the teaching material , student A would have got good knowledge in mathematics .

Respondent-C

Respondent C; one of the 23 years old girls student, studying at grade 10 at Khagendra New life Special education foundation (Jorpati, Kathmandu). He was born at Taplejungyanbark rural municipality ward:2 but at the present she was leaving gokarna-11,Kathmandu. There were nine family members in her family. Father and mother both were farmer. Her school was far from her house and it took 20 minutes to reach school by bus. She had lost her both hands, one hand was lost in her childhood which burnt in fire and next hand was lost while working in the machine.

From three days observation of classroom activities, it found, She speaks less in the class and less participated in the classroom activities. She said "*malaimathematics kahilyai man napanebishaya ho sathaimalae mathematics partibishwaspani chain"*. Being physical disabled

students, she couldn't be able to complete her home assignment. Moreover, there were no any help from her family because she was far from her family.

The answer that researcher got after asking the question about classroom environment to his student, "*madubaihaatko disable student hu .meroanukulko desk , bench chhaina . maile desk mathihaatrakheralekhnnasakidaina ,sir le padayekosamaye ma saranasakdainajaslegarna ma mathematics ma ma din ka din kamjorhudaichhujastolagchha.*" Similarly the researcher asked the question about pedagogical methodology to his student, "*sir le chhitochhitopadhaunuhunchhara ma classroom ma participation garaunupanihudaina .*"

From observation, it is found that to resolve the problem, the teacher should identify the base of student and provide extra time for mathematics practice.

Respondent-D

Respondent-D was a girl of sixteen years from the grade 10. She was born in Kandaghari -06, Bhaktapur District. She was a girl who was without her both arms by birth. She was living with her parents. There were four members in her family. She was single daughter in her family. Her family's economic condition was medium. Her father was a businessman and mother was housewife. Her family was literate.

Main source income was the business in her family. She was interested in mathematics, she was interested to help her father's business stationary product and she was also interested in dancing and singing. She was laborious and curious students. She said "*malaesanai class dekhi mathematics manparne subject ho tar merodubaihat kokuenobhandataljanmajatgumayako le, sir le white board ma lekhyakosarnadilara desk mathi hat rakhsarnasakdain.*" From three days observation of classroom activities, it found due to the limited availability of physically disable

friendly furniture, they faced the problem in learning mathematics. She could speak Nepali language fluently. She said, *"I don't feel difficulty in writing and speaking Nepali language fluently but I found myself weak in communicating with the friends"*. She used to do homework every day and used to attend regularly. She said *"I understood mathematics in the class but I couldn't remember for a long time"*.

Finally as an observer, the researcher have indicated the everyday lives of disable student, it is indicated that physically disabled students face lack of classroom participation. We know that physically disabled students got more difficulty in learning mathematics at school because there lacked the child centered teaching environment. Institution being school as well as hospital, overcrowded people and noisy environment distract the learning environment of disable student like him.

Physically disabled students have poor communication language due to which they get difficulty at school. Physically disabled students are more often dominated by others children; they are often called Apang who make children feel inferiority complex. Even they missed their local mathematics teacher due to which they face embarrassing situation while trying to talk with the other classroom teachers and friends.

Disable student may not be mentally weak, but being physically disables is the greatest problem for them, for which they have to attend hospital regularly and unavailability of special need education in their hometown is an educational problem. Also they have to be guardianless after living in cities area, cannot learn socio and cultural aspect of community, feel unsecure, have to live in rented house alone and face problem of financial issues, face obstacles in their study along with transportation as well. In addition to; teacher's unclear spoken language, limited

time period of particular subject is being another major problem for them in communicating and learning mathematics.

Language

Language is the most of essential affecting factor for failure of physically disable students in mathematics. It is the great medium of human civilization which sets them apart from the other living being. Language is a system of communication medium for thought. It is the major component for learning.

When the researcher observed a class, it was found that there was language misunderstanding between mathematics teacher and physically disabled students to speak formal respected language. Because of this cause, the relation between teacher and physically disabled students and their friend has not been good. From the class observation, the researcher found that physically disabled students are always silent in the classroom. Then the researcher asked to Respondent -A, why do you often remind silent in the classroom? He replied, "*Sir kobhasha Bhojpuri bhaekalesirlebolekobhasanabujda sir le malaeghorerherirahanuhunchhaanimalaidarlagchha*"(Respondent A).

"Over rating speaking of mathematics teacher and difference in language among student and teacher, do not made learning environment good"(students).

From this review we can say, due to in clarity in language of teacher student get hindrance in learning and understanding the mathematics.

"Student being doubly disable (cannot speak and losses body part) made me a bit difficulty in making classroom learning environment interactive."(Mathematicsteacher)

"Students belong to different society having their own native language, which is main cause among teacher and student in learning, so to solve out this problem English language is being made commons to all ".(headmaster)

From these above review, lack of proper understanding of the language, has created the challenges while learning mathematics.

According to vygotsky theory, native language education learning system is best way of learning among individual and mathematics is cultural free subjectbut i found absence by classroom observer.

Language is one of the measure factors for education learning. Similarly in mathematics language has great impact in understanding; if language is student friendly then they can easily understand every problem if not there no any meaning of teaching and learning. Hence according to research of khagendra new life special education foundation the teachers and student must be responsibility. As per respondents they know their mother tongue, as well have different friends who speak different in class. So this brings hindrance in learning mathematics. Finally on the basis of classroom observation of researcher, language is found to be bonding factor for interaction between them and on the other side he gave emphasis on the social constructivist theory which focus on learning of mathematics on their original language and classroom interaction activities with favorable environment, so that everybody would understand.

Episode: 1

"In an observed class, mathematics teacher went to the class and then after the researcher also entered in the class, with him entire students stood up and said good

morning sir! The teacher also wished good morning and told them to sit down. It was noticed that school environment has taught them about the respect for the teacher. There were twenty six students in class. Teacher took the attendance of the students. There were nineteen students present on that day. Teacher said "open your book please" and he wrote the topic Application of a^3+b^3 and a^3-b^3 . He wrote a problem x^3-8 on the white board and solved that. All the students were busy to copy the solution from white board. The teacher didn't review the previous lesson a related topic for application a^3+b^3 and a^3-b^3 and didn't check the homework. After some time the teacher asked with the students, whether you understood the lesson or not. Some students said, "yes sir!" but one of the physically disabled student asked with teacher in own language. Teacher didn't understand his language and teacher asked him, "what do you mean?" and also said that do not use your own language because it is school not your home. After these students other physically disabled students did not try to ask again about their problem they got much depressed and sit on the bench. Again the teacher repeated the problem on the white board and the situation was the same. Then the class is finished.

From the above classroom activities, the researcher found that the physically disabled students often remain silent, frustrated and hesitated to take part in learning activities because of the lack prerequisites knowledge of related chapter. The children generally were afraid of asking questions to the teacher. They felt problem to asked question in the class due to his language that the teacher didn't understand and became angry. Physically disabled students most often receive dominated behavior and have to cope with humiliating environment in the class only because of their poor Nepali language proficiency. There is no pore communication with mathematics

teacher and physically disabled students in mathematics classroom. It shows that the culture of home creates difficulties for learning mathematics. So, interaction also plays vital role in learning mathematics, which creates difficulties.

Irregularity

Irregularity is one of the main problems of disabled students in mathematics learning. Family members thought that physically disabled students could not do anything in their life and they always need the help from other. Due to that concept of the family students are not regular in the school. The concept toward physically disabled students is that they need to stay at home, instead to go school. They are seen irregularity in their school.

Respondent A	1	Average attendance is 8 days in a month
Respondent B	1	Average attendance is 6 days in a month
Respondent C	1	Average attendance is 8 days in a month
Respondent D	1	Average attendance is 9 days in a month

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presented that their attendance in their school is miserable. By this, it is concluded that, their irregularity in school is the main problem in mathematics learning i.e. self problem.

"I am interested in going to school every day but I have lost my spinal chord. I can't attend classroom regularly because I haven't got my family/ parent's with me. I'm victim of spinal chord, and cannot join school bus even, I have to use wheel chair and go to hospital for regular check up as well, since there are no anyone help me. School is about

2.5 km far from my room, which consumer about 40 min. So I get late sometime in class"
(Respondent A).

"I am not regular in school because my school is about 7 km far from my house. It takes about 30 minutes from motorbike reach the school from the house. When I started to go to school almost I could not reach the school on time. Sometime I attend on the or sometimes on second period/ 1st period. My family is rich father provides me all what in need to school like motorbike. I have due to this problem assignment can't be solved"(Respondent D).

From the above it is concluded that the physically disabled students interest to go to school. But due to the lack of school bus, language, physical problem and fear of punishment from teacher, they feel quite difficult and afraid to go to school.

" It is so difficult to teach the students due to their irregularity. Students should be made engage in exercise, after the completion of basic knowledge. But due to their irregularity in the class we get confused whether to revise the lesson or initiate new exercise. Then students are seen being divided in two different groups of irregular students feel them of being weak. Regular students actively take part in teaching learning activity whereas irregular students can't it makes them feel humiliation and they can't proceed forward in learning. This is the main issue of mathematics learning" (mathematics Teacher).

" Due to insignificant facilities of hostel and school but with desired sit for physically disable students, mainly they have to face problem of irregularity in classroom also they miss disable student friendly classroom and furniture as well as parents , these factors huddles them to learn to more".(mathematics headmaster)

" physically disable student are rarely regular in classroom because they get sick often also they should have their parent to assist them but they miss them badly which compelled them to have problem of going to toilet , having snacks etc . Though they have problem of it they should have provided help sister, which is not available and absence of student in mathematics classroom always distract studies"(mathematics teacher).

For the physically disabled students irregularity was the most important factor that caused problem in mathematics learning. Due to their irregularity teacher was confused whether to revise the previous chapter or to start up with a new chapter.

The discussion presented above shows that there is the vast irregularity of the disabled students in the class which justifies that there is great problem in math's learning. The study also shows that many disabled students are unable to go to school regularly which is far from their interest. Some of the students are irregular due to their self problem. Therefore such irregularity has brought the great obstacle in mathematics learning.

Rules are necessary for mathematical learning. Bruner learning theory gives more consideration to process than product; so for physically disabled students regular practice is must. According to social constructivist theory regularity and practice is necessary but as respondents and classroom observation, this are found absence. They lack physically disabled students assistant and classroom regularity. Thought student claims that regularity is must, hence from these three above part, regularity plays heroic role for physically disabled students in making learning methodology meaningful.

Pedagogical Methodology

Pedagogical methodology is the major factor in learning mathematics. Teacher's education, experiences and expertise determine the teacher's qualification. Mathematics is a practical subject. It can be solved by different process and techniques. The way the teacher directly makes effort on the mathematical teaching the student and teacher's behavior, teaching method, practical application of the subject of teaching learning methods are various forms to teaching learning process.

The experienced teacher makes him/her student to understand things in simple and clear way. A trained teacher can attract and motivate the students towards the mathematics with the help of different teaching skills regarding teaching learning process. A trained teacher can use rightly and appropriately the teaching materials and makes the teaching learning easy and interesting. As mathematics is practical subject, it uses the teaching material necessary in the study of this subject. If it can't use appropriate method, then the teaching process can't be effective in mathematics teaching. There are so many method being used such as discovery, problem solving, discussion, experimental, etc.

When the researcher visited in the field, he found that the mathematics teacher has experienced for 10 years. His qualification was B.Sc and B.Ed. he has taken simply teacher training. There wasn't problem on the part of teaching. But there was problem of teaching materials because this school is situated in urban place.

" Teacher always emphasis their own method and they also choose the lesson according to their will school always emphasis on bookish knowledge in mathematic classroom"(Students).

The above views show that selection of teaching method always dominates the students. but the modern view of learning emphasis more collaborative and co-operative methods for teaching and learning mathematics.

"I often used student center method as well as explain the problem steps by steps. But school has problem of availability of teaching materials. We have not sufficient teaching materials as we need. But somehow our school usually promotes the student participation for teaching in the classroom"(mathematics Teacher).

From above review it is concluded that, shortage of teaching material at school is the main problem for distraction of learning environment among students.

"special need education must consist of main teacher and one assistant teacher so that every subjective matter taught by main teacher can be easily transmitted to each and every student through secondary teacher wherever they get difficulty but this kills time and 45 min classroom do not become enough for them to learn so, deprive of this makes classroom learning environment totally weak"(mathematics teacher).

From above review it is concluded that, shortage of main teacher as head and his assistance as secondary teacher, also limited classroom time period of each subject provide physically disable student a hindrance in mathematics learning.

This statement shows that there are some problem regarding the use of appropriate methods, lack of teaching materials and teacher's knowledge of teaching methods.

One episode of the mathematics class is given below it was observed class about the techniques, when researcher went to mathematics class with mathematics teacher. Interest of

learner influences the teaching learning strategies, achievement strategy and achievement of students. When man grows up and develops, the areas of interest is being increasing. Interest depends upon the individual; some area interested in gains, some are is study, music, arts, literature, etc. if the students are interested in mathematics then he/ she enough time to study mathematics and ultimately gets good achievement in this subjects regard. Mathematics as a hard subject, they can't solve the problem and they don't take more time for this subject.

"I feel mathematics is a hard subject because of lack of practice . I mostly do works at least 3-5 hours per days" (student's views).

One episode of the mathematics class is given below was observed class about the teaching techniques, when researcher went to the mathematics class with mathematics teacher.

Mathematics learning has vast dependency with pedagogical methodology. For mathematics learning students should have social interactive environment. According to social constructivist theory, students are to be enrolled in different group on basis of collaboration with friendly environment and also teacher must taught their pupils on basis of ZPD, in addition for weak students on basis of scaffolding, more time and effective environment should be constructed. Similarly on basis of Bruner learning theory education should be targeted into process then product and disabled students with disabled friendly environment. If we talk about weakness, teacher or classroom observer shows limitation of time for students for learning especially for disabled students, hence of respondent version's conclusion for mathematics learning physically disabled student should be taught with scaffolding and reinforced method also the mathematics teacher must be well trained.

Episode 2

One day teacher went to the classroom first then , the researcher also entered into the class. All students stood up and said a good morning sir. The researcher told them to sit down. It was noticed that the school environment has taught them about the respect to the teacher. On the other hand teacher started to teach mathematics. He did not review the previous lesson but directly he wrote problem of mixed type of factorization e.g. $(a-b)^2-81$ from practice book and did problem on the whiteboard by explaining step by step. After one demonstration, he gave one more problem to the physically disabled and normal students to solve. It was an individual practice problem. The teacher then just walked among the students and guided them wherever they get difficulty. Whenever he found mistake he came to white board and explained to the problem how to solve, again teacher asked the formula of $a^3 - b^3$ and $a^3 + b^3$, but maximum student didn't answer and he punished them with ruler on their hand and advice them to read and write, and will punished them badly if they couldn't be able to answer tomorrow, he suggested and he leave the classroom, Then finished the class.

Finally the above view and class observation, we can say that physically disabled student's main problem is absence of getting conceptual method of teaching. It is also found that the techniques are not enough to learn mathematics for physically disabled students as well.

Classroom Participation

Classroom participation are social association connection or affiliation between two or more people who may interact overtly, covertly, face to face or may remain effectively unknown to each other. Such as those in a virtual community who maintain anonymity and so not socialize

outside of the classroom. In this study the classroom participation means the relation and class work of Physically disabled students with mathematics teacher and other students of the class.

"we want to make good friendship with other students but they do not like"(students).

"Disabled students use friendly language with other students and with me also. They are dirty in appearance they are not lovely"(mathematics teacher).

From the above views, it shows that students are interested to make good interpersonal relation with other students and mathematics teacher at class. It is noted that they are dirty in appearance and poor in Nepali language proficiency.

"Physically disable students vs teacher learning and classroom participation environment must be friendly but is found absence so, environment would be better if teacher had taught student knowing their mathematics learning ability" (students).

"Mathematics is the regular repetition practice subject though, I found first rank holder student of the classroom is mentally good but is physically disable as a result, he cannot write even, cannot do regular practice and need a assistance which is not possible as a result he found difficulty in involving the student on classroom group participation and making the classroom effective"(Mathematics Teacher).

From above the view, it show that mathematics is culture free subject where each and every student can learn mathematics well but friendly learning environment among disable students is found absence, as a result learning way to student is being subject of challenges.

In observed class researcher's four key respondents were silent in the class. Among them respondents were more silent. The researcher asked question with them, saying why do you

silent in class? They simultaneously said we like to be silent sir. They were afraid of asking question in the class. They felt difficulty to ask question with the teacher due to their language problem.

Classroom participation is the one of the meaningful and successful factor for Mathematics learning. As per social constructivist theory classroom is one society. With consolation with friends, family and teacher they gain knowledge. Similarly as per Bruner learning theory, in classroom on reinforcement basis mathematics learning should be made effective. Importantly providing scaffolding to student who are disabled. Students should be made active participation is mathematics learning. So, according to respondents and classroom observer, physically disables students are found to be inactive in classroom participation and also teacher found to failed in creating suitable environment for them. Hence to make mathematics learning meaningful social constructivist theory and Burner learning theory are to be implemented.

Episode: 3

In the school visit in the observed class in mathematics teaching one day the mathematics teacher entered the classroom with the daily using material. Researcher also good morning sir. Teacher said morning and sit down. Teacher opened the practicebook and wrote a problem of HCF or GCF on the white board without giving concept. It could be seen that all the students were engaged to write the solution from the whiteboard. Some time teacher asked do you understanding and some students say yes and some person 'no' but physically disable students could not be able to copy teacher's solution. In this way the enough dedication of teacher toward student become worthless because of time limitation being some of disable student in classroom. In this way the teacher do over of the class and student didn't get any concept on thistopic.

By observing all the activities the researcher found that there is not good communication between disabled and other children. They sit and have snacks together, but their company is different and not communication or interpersonal relation about mathematics problems. My key children disabled students feel shame to ask anything with teacher and they don't speak more with other children. Their interpersonal relation teacher and other children was not developed nicely. It is seriously, to be concluded that disabled students most often receive dominated behavior and have to cope with humiliating environment in the class room only because their poor Nepali language proficiency. There is not proper communication with mathematics teacher and disabled students in the mathematics class room shows dominance to disabled students for mathematics learning. The above discussion also indicates that the mathematics teacher neglects the problem of physically disabled students in learning mathematics due to language. So

interpersonal relations also influence to learn mathematics and they feel difficulty in learning mathematics, there is not good classroom participation with physically disabled students and other members of the class room. Hence there is cultural language discontinuity in classroom, which are the difficulties of physically disabled students for mathematics learning.

School Environment

School Environment means the extent to which school setting promote student safety and student health which may include topics such as the physical plant, the academic environment, available physical and mental health supports and services and the fairness and adequacy of disciplinary procedures as supported by relevant research and an assessment of validity. School is a second home of any child school environment reflects belief and tradition of the school community delineating the relation among parents, students and teacher. Regarding my study,

"the number of normal was higher than number of physical disable students. Normal students used sit in the first bench so physical disabled students did not get the chance sit in the first bench due that reason also they were poor in learning mathematics. But the problem of sitting in the bench was not solved by the teacher in the classroom "(students).

"The physical infrastructure of this school was not good for the disabled children, students were not able to write in the copy by keeping on the desk and there was not sufficient place to move on the wheel chair in the classroom"(students).

The above views of students indicate, Students want the rotation system in the classroom because disable children also want to sit in the first bench and physical infrastructure should be the suitable for the disabled students.

"There should be different classroom for the physical disabled students, teacher should be movable inside the whole classroom, there should be mathematics lab and facility of ICT in classroom" (Teacher).

"we do not have the sufficient classroom, toilet, play ground, library, mathematics lab for the physical disabled students for that purpose we are trying", some of building are destroyed by the earthquake so we don't have sufficient room for the physical disable children, for that we going to construct the classroom which would be the suitable classroom for the physical disable students" (Head teacher).

The above views indicate that there should be suitable physical infrastructure for physical disable students to learn mathematics.

"I use learner centered method as well as explain the problem step by step in the whiteboard for their understanding but physical disabled students don't understand my pronunciation and applied methodology "(mathematics teacher).

In mathematics teacher view his teaching method is child centered. But due to the language problem they are unable to understand the lesson.

" we provide the report cards of student's achievement for parents. If the students are failed in mathematics of have low performance then we invite to the at school but disabled students parent do not respond it" (head master).

According to headmaster view if the students are failed in mathematics or have low achievement the just calls their parents and suggests giving extra class of tuition to the physically disabled students but the parents do not respond.

Finally from above view, it indicates that the school infrastructure influence achievement of the physically disabled students. The physically disabled centered school infrastructure can give better chance to learning mathematics and other activities.

Mathematics needs more labor and effort than other. Physically disabled students had not obtained such facilities at school and living hostel. Physically disabled students some parents of students are literate and some illiterate. In similar way, physically disabled students are generally dominated by other students. they are often called 'Apang' in everywhere. So, they feel some form of humiliation in learning mathematics. Teacher also didn't give more attention for their effective learning because of their friendly language so that, due to these various reasons they are backward at school. These all the reasons matches with the theory of discrimination of physically disabled students. finally, researcher found that the discrimination of physically disabled students at living hostel, home and school were unmatched. So, the physically disabled students felt challenges in learning mathematics. It is said that living hostel environment of physically disabled students is in favor of the learning mathematics and school environment is not conducive for learning mathematics. The poor school infrastructure, unsuccessful to the while learning mathematics and other occupation and unmatched discrimination at living hostel and school, negligence of parents involvement, not sufficient learning mathematics opportunity at living hostel and school are the main factor that obstruct in creating proper learning environment at living hostel and school.

School environment is one of the important aspects of mathematical learning. For this environment should be children friendly. According social constructivist theory mathematical learning should be favorable inside and outside classroom. In addition, should be disabling friendly fulfilling all basic demands of them. Classroom physical infrastructure as well as

psychological facilities with social and environment friendly learning environment should be favored for effective mathematics learning. As per Respondents and classroom observer there is found to be absence of double friendly environment and same view from social constructivist learning theory. So, with accordance of Vygotsky's theory there must be disable friendly environment. Due to which we can see thing triangular relation among report, learning theory and respondent.

Chapter-V

FINDINGS, CONCLUSIONS ON AND IMPLICATIONS

This chapter is basically concentrated in deriving some finding from the discussion of chapter IV. Besides findings and conclusions it has some educational implications, which are also discussed on the basis of overall study of the disabled children. Physically disabled students faced different difficulties such as: discrimination towards physically disabled students, language, classroom participation, irregularity pedagogical methodology, school environment. All peoples see them with different views. Physically disabled students feel uneasy everywhere because they tried to endure the discrimination done by the normal students ,mathematics teacher, head teacher and so forth. This framework also shows that how physically disabled students are discriminated by people. Language is one of the major problem of physically disabled students. How? Teacher taught them in communication language which they did not understand at all. In this way, it is a problem. Irregularity is significant problem of them they can't reach or go to school due their legs, hands, spinal-cord problems; teacher's view is also a problem for being discontinuity as well as irregularity.

Learning environment at school is not appropriate of the physically disabled students so they become irregular in the class and some time leaves the school too. The teachers them by using his/her teaching techniques. The teacher should pay attention about the interest of students while teaching them in the mathematics classroom. Teaching methodology used by teacher is also one of the problems of physically disabled students which they can't understand easily. They feel challenges in learning mathematics problems which are described above, are the problems faced by the disabled students.

Findings of the Study

This is a case study related to challenges faced by physically disabled students in learning mathematics in secondary level in Kathmandu District. The purpose of the study was: to identify the areas and cause of challenges while learning mathematics. For this purpose the specific objectives were to find the areas of challenges while learning mathematics of physically disabled students and to find the causes of challenges to physically disabled students in learning mathematics. The major tools used for this study were interview schedule, class observation form and related published and unpublished documents. The design of this research was explanatory case study in which meanings were derived from total study; logic and reasoning of why and how it was like that, linking with theories. The case study of those sampled school children was carried out through participant observation and in-depth interview for the case study, two boys and two girls were taken; who were studying in grade ten was taken as the example to support the findings of the study, Vygotsky's theory of social constructivism learning were used and from this case study of challenges faced by physically disabled students while learning mathematics following are the major finds.

- There is not proper interaction and communication between physically disabled students and mathematics teacher at school.
- There is no proper interaction between physically disabled students parents and school, mathematics teacher and school management committee about their children activity.
- Physically disabled student find problem in understanding teacher's teaching language, due to which they cannot interact with each other easily.
- There is a discontinuity between practice of mathematical concept living hostel and school.

- The living hostel and school environment is not suitable for mathematics learning of physically disabled students.
- At the school they always receive dominating behavior by other students and teachers.
- Disabled students financial condition is not strong enough to send their children at school and needy tuitions classes.
- There is time limitation for physically disable student to solve out any problem arises in classroom.
- School environment, language, irregularity in school, classroom participation, and pedagogical methodology are the major challenges in learning mathematics.
- Students feel difficulty in learning mathematics because of their less practices of mathematics due to their physical disability and teachers' negligence towards the students.

Conclusions of Study

Regarding the conclusion, the researcher derived from the field works in Shree Khagendra New life foundation Education, Kathmandu that physically disabled students are very high in numbers in the school but the result is not satisfactory. Most of the low achievement is found in mathematics subject as they attended the class rarely. According to mathematics teacher, physically disabled students are poorer than other students in learning mathematics. From the study , the researcher draws the following conclusions:

- Language plays the vital role in learning mathematics, due to which the lack of proper understanding of the language;it has created the challenges in learning mathematics.

- The learning environments play vital role for better performance in learning mathematics. The lack of proper environment at school as created the challenges while learning mathematics.
- The culture also play vital role in learning mathematics. Due to unmatched culture at hostel and school, student's difficulty level arises in learning mathematics.
- The appropriate management of time plays a vital role in learning mathematics, due to which physically disabled student cannot enroll in classroom participation as a result mathematics learning become the subject of challenges for them .
- Regularity plays the vital role in learning mathematics, due to which absence the student cannot learn concept on every topics of mathematics.
- Student centered teaching methodology plays vital role, due to which absence student are de-motivated in learning mathematics.
- Due to the less practice and less of continuous encouragement and motivation by the teachers, students feel difficulty and challenging while learning the mathematics because of their physically disability

Implications of Study

This is a case study related to difficulties faced by physically disabled students in learning mathematics at secondary level in Kathmandu District. According to the finding and conclusion drawn from the study, the recommendation further study. The following are some of the issues not answered and be further studied to validate the result of the study.

- This study is done with in limitation and in particular area. The board and general study may be done for overall physically disabled students.
- A similar study can be done for basic level and other subjects.
- A study can be done on the causes of school, dropout problem of physically disabled students.

REFERENCES

- Acharya, B.R. (2072). *Foundation of mathematics education*; Kirtipur, Kathmandu: DikshantPrakasan.
- Acharya, B.R. (2015). The study on inclusive mathematics classroom practices in schools of Arghakhachi District. *A Journal for Council for mathematics education Forum*; Kathmandu Nepal.
- Adhikari, H.B. (2010). *Problem faced by blind students in learning mathematics geometry at secondary level*. Unpublished doctoral dissertation, FOE, Tahachal, Kathmandu.
- Atherton, J.S.(2005). *Learning and teaching: construction in learning*. Retrieved from <http://www.Learning and teaching.htm>.
- Balaban, N.(1995). *Seeing the child, knowing the person*. In Ayers, W.To become a teacher: Teachers College Press.
- Bell,F.H.(1979). *Teaching and learning mathematics in secondary School*.USA: Wincbrow C. Brown company publishers.
- Bruner, J. (2007) .*General learning process*. (<http:// J. Bruner.html>).
- Bruner, J.(1966). *Stables that a theory of instruction should address four major aspect*.
- Bruner, J.(1996).*The culture of education*. Cambridge, MA: Harvard University Press.
- Constitution of Nepal, (2072): *Constitution of Nepal*: government of Nepal
- CRN,(2011). *The Census Report of Nepal has classified disability into seven distinct groups*: [http://: www. Gov.np](http:// www. Gov.np).
- Lennard, D. J. (1997). A situation analysis disability in Nepal: <http://: www.oric>.
- Foster, J. P. (2010).Fast sheet physical disabilities; Dean of the College and professor of physics: *Hopkins Hall*(Joyce. P. Foster @williams.edu)

- Furth, H.G.(1994). Research with deaf implication for language and cognition. *Psychological Bulletin*.
- Hanich. L.B.,Jordan, N.C, Kaplan, D., Disk, J. (2001). A Study on article " *Perjross different areas of mathematical cognition in children with learning diffi*
- Hassain, I. Bashir, M., Neceer, .M.,Naeem,. M., Akthe, S., Immaullah, H. (2011). Problem faced by physical handicapped students in educations. *Journal of education institutions Kohat, Pakistan, pp. 23-26.*
- <https://definitions.uslegal.com/d/disabled-students/>.
- NEADS:https://www.neads.ca/en/about/projects/inclusion/guide/pwd_01.php
- NPAD.(2006).A Study of article "*National policy and action on disabled students*":
<https://rcrdnepa.files.wordpress.com>.
- Pangali, L.R.(2005). *Difficulty in Learning Arithmetic at grade IX* : Unpublished doctoral dissertation, Tribhuvan University, Kirtipur, Kathmandu.
- Pradan, J.B (2015, April) .Vygotsky's theory and its implications in mathematics classroom. *Journal for Council for Mathematics Education fulrum; Kathmandu Nepal,pp.22-27.*
- Racheal, B.M.(2017). Attitude of academic community towards physically challenged students in the university of Maiduri: *Volume 08. No.1p journal of education practice.*
- Sutton &Kruder. (2015).*Supporting students with learning disabilities in mathematics* : York catholic District school Board.
- Vygotsky, L.(1978). *Mind in society: the development of higher psychological process.*
 Cambridge, MA: Harvard University press.
- Yadav, G.K.(2014). *Mathematics learning problems of disabled students*: Unpublished doctoral dissertation, Tribhuvan University, Kirtipur, Kathmandu.

Yadav, B. R. (2017). *Difficulties faced by Dalit students in learning mathematics*: Unpublished doctoral dissertation, Tribhuvan University, Kirtipur, Kathmandu.

Appendix-A

Interview Guidelines with Physically Disabled Students

Name of the Students:.....

Roll No:.....

Age:.....

Girls/Boys:.....Place of Birth:.....

Position in the Class:.....

Place of residence:.....

The interview in the Physically Disabled Students will be taken on the basis of following main topics.

- a. Personal history.
- b. School environment.
 - Physical infrastructure in classroom.
 - Physical infrastructure in school.
 - Physical facilities in class and school.
 - Better infrastructure in mathematics class.
 - Condition about desk bench .
 - View about school environment.
- c. Language.
 - language use by mathematics teacher in class.
 - Language problem to communicate with mathematics teacher.
 - Language us barrier is your mathematics learning.
 - Word problem in language.

- d. Classroom participation in mathematics learning
 - Attention in mathematics class.
 - Disturb from any other friends.
 - Reading opportunity at classroom .
 - Practice mathematics in class.
 - Classroom participation individual or groups.
 - Relation between Physically disabled students and mathematics teacher.
 - Problem of physical infrastructure to particulate of mathematics learning.
- e. View about mathematics teaching strategies.
- f. View about mathematics
- g. View about mathematics teacher
- h. Causes of irregularity

Appendix -B

Interview Guidelines with Mathematics Teacher

Date of Interview:.....

Name of Mathematics Teacher:.....

Age:.....

Qualification:.....

Sex:.....

Training:.....

Experience in Teaching:.....Address:.....

The interview with the mathematics teacher will be taken on the basis of following main topics.

a. Teaching methodology.

-Using teaching materials.

-Different teaching strategies.

- Co-operation between each other

-Problem on teaching physically disabled students.

- Your concept on physical disabled student to teach mathematics.

b. Participation in the class.

-Students are regular or irregular in class.

-Student's participation individual or group.

- Encouragement provided to the students learning.

-Relation between mathematics teacher and students in class.

-Practice of mathematics

-Learning opportunity

c. School environment.

- Physical infrastructure in classroom and school.
- Physical facilities in school
- Better infrastructure in mathematics class.
- Condition about desk bench .
- View about school environment.

d. Effect of language in learning mathematics.

- Problem of language communication.
- Difficulties of language for students .
- Language problem to communicate with mathematics teacher.
- Language us barrier is your mathematics teaching.
- Word problem in language.

e. View about mathematics

f. View about physically disabled students

g. Causes of irregularity

Appendix-C

Interview Guidelines with Head Teacher

Date of Interview:.....

Name of head Teacher:.....

Age:.....

Qualification:.....

Sex:.....

Training:.....

Experience in Teaching:..... Address:.....

The interview with the head teacher will be taken on the basis of following main topics.

a. School environment.

-Physical infrastructure in classroom and school.

-Physical facilities in school.

-Learning environment in school

-Better infrastructure in mathematics class.

-Condition about desk bench .

b. Effect of language in learning mathematics.

-Problem of language communication.

-Difficulties of language for students .

c. Teaching methodology.

-Using teaching materials.

-Different teaching strategies.

d. Physically disabled students and teacher relation.

-Encouragement provided to the students learning.

- Students are openly talking with teacher.
 - Feedback for students.
 - Students opportunity for learning with teacher.
- e. Guidance for mathematics teacher
 - f. View about physically disabled students
 - g. Causes of irregularity

Appendix –D

Observation form for Student's participation in learning in the class

Student's Attendance	Teaching activities	Topic	Student's Participation Individual	Student's participation in Group	H.W.	C.W.	Observation Comments