

**IMPLEMENTATION OF SEMESTER SYSTEM IN MATHEMATICS
EDUCATION: CHALLENGES AND OPPORTUNITY**

**A
Thesis
BY
PUJA TIWARI**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE
OF MASTERS EDUCATION**

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शिक्षा शास्त्र केन्द्रीय विभाग

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LETTER OF CERTIFICATE

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LETTER OF APPROVAL

This thesis submitted by **Ms. Puja Tiwari** entitled on “**Implementation of Semester System in Mathematics Education: Challenges and Opportunity**” has been approved as for the partial fulfillment for requirement of Master’s Degree in Mathematics Education.

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RECOMMENDATION FOR ACCEPTANCE

This is to certify that **Ms. Puja Tiwari** has completed her M.Ed. thesis entitled **“Implementation of Semester System in Mathematics Education: Challenges and Opportunity”** under my supervision during the period prescribed by the rules and regulation of Tribhuvan University, Kirtipur, Kathmandu, Nepal. The study embodies the result of investigation conducting during the period of 2020-2022 under the Department of Mathematics Education. I recommend and forward her thesis to the Department of Mathematics Education for the final viva-voce.

Date: 13th May 2022

.....

Prof. Dr. Bed Raj Acharya

(Supervisor)

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Declaration

This thesis does not contain any others work which is offensive and beyond the copy write norms. To the best of my knowledge and beliefs this research is truly based on my effort and it does not match with any researches that were published earlier in this university as well as others. I take all the ethical and legal responsibility for submitting this thesis.

.....

Puja Tiwari

Dedication

This work is heartily dedicated to my respected parents Ram Dev Tiwari and Bina Tiwari and my all family members whose support, love, care and sacrifices made me a person who I am now.

Acknowledgement

First of all, I would like to thank the Department of Mathematics Education and Central Department of Education, Krittipur for providing me an opportunity to carry out this research work. I extend my sincere thanks to all those who supported me during this research.

I would like to express my deep and sincere gratitude to my respected supervisor Prof. Dr. Bed Raj Acharya, Head of Mathematics Education Department for his valuable suggestions, guidance, encouragement and continuous support throughout this research. His dynamism, vision, sincerity and motivation have deeply inspired me. He has taught me the methodology to carry out the research and to present the research works as clearly as possible. It was a great privilege and honor to work and study under his guidance.

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At the same time, I am extremely grateful to my respected Professors and lecturers of Central Department of Mathematics Education for their kind cooperation, valuable comments, suggestions and providing opportunity for the collection of data. I am also very much indebted to the fourth semester students, semester first & third batch students for their kind co-operation and support for collection of data. Without their support it was impossible to accomplish this research.

Finally, I would like to express my sincere thanks to my respected parents, friends and all the members of my family for their immeasurable supports, love, prayers and sacrifices for educating and preparing me for my future.

Abstract

This is a qualitative research on the topic entitled “Implementation of Semester System in Mathematics Education: Challenges and Opportunity”. The objective of this study was to explore the existing practices of the semester system, the major challenges and opportunity of the semester system and process of making semester system students friendly. The study site of this research is Central Department of Mathematics Education, Tribhuvan University Kirtipur Kathmandu. Purposive sampling method was used to select representative respondent. Open and in-depth interview, classroom observation, and FGD, were the tools adopted for collection of information. The collected data were analyzed according to general inductive method and on the basis of my conceptual framework.

The major findings of this research indicate it is necessary for students to qualify the entrance exam for admission in the Central Department of Mathematics Education which is conducted by Dean Office. Similarly, the number students enrolling in semester system has decreased. There is the practice of internal evaluation which is conducted by the teachers for 40 marks, out of the 100 marks with specific criteria. There is the practice of external evaluation which is conducted by the Dean Office for 60 marks, out of the 100 marks. Similarly, there is more utilization of the student centered methods and digital tools. The main challenges of semester are conducting delayed exams, lengthy course content, unavailability of curriculum-based books and experimental materials, copying and pasting the teachers notes, never explain the use and application of theorem, centralized practices of curriculum formation, less practice of open question in mathematics classroom etc. The main opportunity of semester system are study mathematics in Visualise Method by using various and advanced software's, well-fascilitated ICT lab, learn different mathematical software's like Geogebra, Mathematica, Latex etc.,large video

conferencing studio, to Book Review, Writing, Seminar Paper, Literature Review, Proposal and Thesis, get scholarships provided by the UGC and being excellence researcher.

It is found that making semester system students friendly need to focus on course content, full authenticity to the teachers, student-centered teaching methods, group works, allow students to present their seminar papers in a conference and timely exam according to the operational calendar formation by Dean office.

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Chapter 1

Introduction

This research focus on challenges and opportunity of semester system in Mathematics Education at Tribhuvan University. The first chapter of this study is introduction. Thus this chapter includes background of the study, statement of the problem, research question, objective of the study, rational of the study, delimitation of the study and definition of the key words.

Background of the Study

Higher education is very important for the development of the nation. It is recognized today as a capital investment and is of paramount importance for economic and social development of the country. Quality higher education is a source of great potential for the socio economic and cultural development of the country(Chongbang, 2013). The extent to which education is able to contribute to the process of socio-economic development and transformation of the nation depends on the trained and qualified human resources developed by the universities.

History of Higher Education in the Context of Nepal

Modern formal education in Nepal is said to have begun with Durbar High school that was established after visit to Britain by Prime Minister Jung Bahadur Rana in 1850 (Sharma 1990). Tri-Chandra College was the first higher education institution established in 1975 BS by Rana Priminister Chandra Samsher. After establishment of democracy in 2007 BS, Nepal National Education Planning Commission was formed in 2010 BS and it submitted its report named 'Education in Nepal' in 2011 BS. One of the major recommendations of the commission was that national level university should be established as soon as possible (Sharma, S.Bista, K.&Ray,R.2019). Consequently, Tribhuvan University was organized in 2012 BS and

it was established in 2016 BS (1959AD) by the recommendation of NNEPC (1954) is the first national institution of higher education in Nepal. Kanti Rajya Laxmi Shah was the first Vice Chancellor (VC) of this university. It was the great achievement in the field of higher education (G.C., 2019).

The National Education System Plan (1971) was the new as well as reformatory plan in the sector of education regarding higher education. At that time, the semester system was implemented in higher education but it was terminated in 2036 BS (Upadhaya, 2059 BS). The student unions and political parties were not in favor of semester system because of heavily engagement teachers and students in study and learning process. The students' movement launched in 1979-1980 demanded to cancel semester system and the then government cancelled and continued the annual system (Sapkota, 2019).

After the recommendation of Royal Higher Education Commission (2040 BS) Tribhuvan University was not in a single existence in the contribution of higher education, Mahendra Sanskrit University (namely Nepal Sanskrit University today) was established in 2043 BS (G.C., 2019). Currently, Nepal has 11 universities, these includes Tribhuvan University, Nepal Sanskrit University, Kathmandu University, Purbanchal University, Pokhara University, Lumbini Bauddha University, Mid-Western University, Agriculture and Forestry University, Far-Western University, Nepal Open University and Rajshri Janak University) in existence in the present context of higher education in Nepal (UGC 2017).

Faculty of Education (FOE) has great history to provide the education in the Nepalese context. Teacher education in Nepal was started with the establishment of Basic Teacher Training Program in 1947. As the need of teachers and teacher training was realized by the then government of Nepal, Nepal National Educational Planning

Commission (NNEPC) 1954-55 recommended for College of Education which was materialized in 1956. The main objective of the College of Education (COE) was to produce trained manpower to teach at the primary and secondary schools. Thus, with the establishment of the College of Education, teacher training in the country took a definite shape. In 1971, National Education System Plan was introduced in the country and COE was renamed as the Institute of Education (IOE). A decade later in 1982, following the recommendation made by the Royal Commission on Higher Education, IOE was given the status of the present Faculty of Education (TUFOE).

Faculty of Education (FOE) is the largest faculties under Tribhuvan University in terms of the number of students and the number of campuses which are ever increasing. In the beginning, the collage of education was established in Chet Bhawan Lazimpat, Kathmandu and then moved to Kirtipur (the present place) in 2023 B.S. The institute of Education is now renamed as the Central Department of Education. With its 26 constituent campuses and 590 affiliated campuses throughout the country, it has the biggest network of teacher training. Through its different courses which are taught in different program viz. One Year B.Ed., Three Year B.Ed. and Two Year Med, MPhil and PhD. The PhD program in education initiated in 1996 with a view to preparing high level academic and researchers in the field of education. FOE produces trained educational manpower as teachers, teacher trainers, educational planners and managers, educational researchers, curriculum designer and all sorts of human resources needed for the educational sector of the country(TUFOE).

Semester system in Tribhuvan University has also been introduced as a globally contemporary higher education system through its open and distance learning (ODL) system. In the recent innovation of TU as a semester system has been endorsed in the board meeting of executive council on 32nd Shrawan, 2068 B.S. That board

meeting has been passed the agenda of semester system in four year Bachelor of Teacher Education (B. T. Ed.) program as a regular higher education program. Similarly, Bachelor of Teacher Education (B. T. Ed.) and Master of Teacher Education (M. T. Ed.) in Open and Distance Learning mode this system was implemented after passed such agenda from the executive board. In the same way, in the next meeting of executive board in Ashwin 7th 2069 BS, semester system in the additional stream of higher education was passed as an agenda. After that time, Physics Education to Mahendra Ratna Campus and Biology Education to Sanothimi Campus Sanothimi Bhaktapur as well as Gorkha Campus Gorkha have been run in the semester system(G.C.,2019).

The meeting of executive board on Jestha 28th 2070 BS has decided to implement the semester system in various subjects of Central Department in Kirtipur. The academic year of 2071/2072, Tribhuvan University has implemented the semester system in master degree at Central Department as a first phase. The second phase of semester system in master degree in the Kathmandu Valley has been implemented from 2072/2073 BS. Similarly, from the academic year 2073/2074 BS, all the constituent and affiliated campuses of TU have been running in the semester system of their master degree program. Nowadays, some of the Bachelor's degree, and all master's degrees and Master of Philosophy (M. Phil.) degree in education have been run in the semester system (G.C. 2018). Though, semester system is implementation in 61 constituent and 1111 affiliated campuses (Basnet,2019), it has different types of practices, challenges and opportunities to be sustained. In this regard I have expressed my interest to explore the existing practice, challenges and opportunity of semester system in Mathematics Education.

Statement of the Problem

Nepal's oldest and still largest Public University Tribhuvan University (TU), as one of the 1000 Universities of the world (The World University Ranking, 2018). Tribhuvan University has implemented new program 'Semester system' in master degree at Central Department at first phase in the academic year 2071/72. The second phase of Semester system in master degree in the Kathmandu valley has been implemented from 2072/73 B.S. Similarly, from the academic year 2073/2074 BS, all the constituent and affiliated campuses of TU have been running in the semester system of their master degree program. Nowadays, some of the Bachelor's degree, and all master's degrees and Master of Philosophy (M. Phil.) degree in education have been run in the semester system.

Semester system is new for annual students. In annual system, students give exam yearly and there is not any system of compulsory attendance, Students don't have burden of exam, assignment and projects until the end of academic year. But in semester system, students are selected on a merit basis based on an entrance exam; they are kept busy at the same level of burden throughout the session; they are required to be regular for completing tasks and projects and participated in group discussions, presentations and viva; and internal assessment is adopted for reducing over-dependence of external evaluation. In this context, I want to explore how can they practice semester system?, Which type of challenges they faced? How can they manage their time? How can they prepare for exam? How can they submit assignments? Which type of learning opportunity they achieved? etc. Also, there is a lot of studies carried out on the topic semester system with different aspects in quantitative design but there are no studies carried out on Semester system in Department of Mathematics education regarding "Implementation of semester system

in Mathematics education: Challenges and Opportunity “in depth qualitative design.

In this regard, I am highly motivated to research on the topic, "Implementation of semester system in mathematics education: Challenges and Opportunity.

Research Question

The research question of this study were as follow as:

1. What are the present practice of semester system in Mathematics education?
2. What are the challenges faced by teachers and Mathematics students while study Mathematics Education in semester system?
3. Which type of learning opportunities achieved by mathematics students in semester system?

Objective of the Study

The objectives of this research were as follow as:

1. To find out the current practices of semester system in Mathematics education.
2. To explore the challenges faced by teachers and students while teaching-learning in semester system.
3. To explore the opportunity achieved by students while learning in semester system.

Rationale of the Study

Semester system is found to be originated from German in 1820-30 AD.

Semester word is derived from 'semes trial' which is an adjective, literally means six month period, adopted into American usage in the early 19th century as a half-year term of typically 15 to 18 week. Nepal's UGC Guidelines for PhD and MPhil 2017 defines as "Semester means an academic program of at least 15 weeks including practical class generally having one credit hour per week"(UGC,2017). Semester system is an educational system which is associated with the process of making

teachers and students regular, creative, engaged in learning, doing remedial instructions if needed, closely monitoring the progress, use internal assessment for evaluation, make presentations, do project works, concentrate on specific subjects, involve in group work, etc. It is believed that these activities enhance achievement and lead to high pass rate. It involves focused attention of students and teachers on teaching and learning; it is more organized and interactive in the classroom because it involves pedagogical processes instead of methods, the number of students (quota) in the classroom is fixed; they are selected on a merit basis based on an entrance exam; they are kept busy at the same level of burden throughout the session; they are required to be regular for completing tasks and projects and participate in group discussions and presentations; and internal assessment is adopted for reducing over-dependence on external evaluation. There is provision of internal evaluation (40%) and external evaluation (60%). Scoring is based on GPA (Grade Point Scale). The total course is divided into 3 credit-hours.

The whole activities of semester system are trying to create all round development of students. The main objective of this system is to enhance students' knowledge, skill and capacity continuously, extensively and in-depth. Though semester system is fruitful for mathematics students, it has many misconceptions, challenges and opportunity. In this context, the result of this study would provide precious knowledge about semester system that enables teachers, students, parents, staff members, affiliated institutions of TU, and TU family to be familiar with semester system and know everything about semester system. This study would support to analyze the major challenges and opportunities of semester system in future. The result of this study would help to modify the policies and practices of the university and its constituents as well as affiliated collages. If there would be positive

impacts of semester system then the result of this study would help to promote student enrollment in university. This study would not only help to learn about challenges but also helps to know opportunity of semester system.

As a new system, students and teachers feels difficult to learn in semester system in such circumstances this research would be fruitful and supportive document to learn math in semester system. This study would helps to all teachers who teach in semester system. Also, this study would help to find opportunity of semester system that suit in the global teachers' context. The findings of this study would provide valuable information to teachers, students, administrators, planners for the better implementation of semester system.

Delimitation of the Study

The main delimitations of this study are as follow as:

-) This study was limited to the Central Department of Education, Department of Mathematics Education Kirtipur, Kathmandu.
-) This study was delimited only in qualitative design.
-) The source of primary information of the study was delimited to the primary stakeholders like teachers, students, administrators and experts of central department of Mathematics Education

Definition of the Key Terms

Assessment System. Educational assessment or educational evaluation is the systematic process of documenting and using empirical data on the knowledge, skill, attitudes, and beliefs to refine programs and improve student learning.

Challenges. The major problems depending up on the issues and creating the barriers to implement semester system in different faculties under Tribhuvan

University. A source of trouble, difficulty faced by teachers and students in implementation of semester system. The problem is related with objectives, content, activities, evaluation and professional development. If researcher gets negative view\opinion on any statements then it is taken as challenges faced and this view is approved by interview.

Grading System. The ranking system using letter grade symbols according to the direction of Dean's office towards students and their achievement task.

Opportunity. A situation that make it possible to do something that you want to do or possibility to doing something.

Semester System. Semester system is an educational system which is launched by dividing an academic year into two terms (six months), scaled down credit hours and provisioned continuous assessment. In T.U., it was practiced from 2070 B.S., includes two evaluation techniques i.e., internal and external. 80% regularity is must for student to be appear in exam.

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Chapter II

Review of Related Literature

Literature Review is a very important aspect of academic research and essential element of research design. A literature review is a written summary of journal article, books, and other document that describes the past and current state of information on the topic of research study (Cresswell, 2009). It gives deep knowledge to study any title of research and supports to make a reliable research. The main purpose of literature review is to find the gap, to contribute the existing knowledge and to develop conceptual and theoretical framework. This chapter includes the different features of review of articles and findings of different researches in the field of Mathematics Education especially related to the semester system. Review of related literature is carried out in three heading which are empirical review, theoretical review and conceptual review which are explained below in separate headings:

Empirical Literature Review

Behera, Mehar and Baral (2018) conducted research study on "the perceptions of both students and teachers about the implementation of semester system of examination at Undergraduate Level" under Ravenshaw University, Cuttack, Odisha, India. The objectives of this research was to study the perception of students and teachers towards the implementation of semester system with reference to the prescribed curriculum, feedback and evaluation procedures, and students' performance under semester system. The descriptive survey method was employed for conducting research. The present study was delimited to the students and teachers of Rajendra College, Bolangir, Odisha, from where 90 students and 30 teachers were selected as

the sample through random sampling. A perception scale for both students and teachers were prepared separately for collecting data and the data was collected by giving a personal visit. The obtained data were analyzed by simple percentage techniques. The findings revealed that teachers and students perceived the semester system as better than the traditional system of examination and opined that it was highly applicable for both UG and PG level. It was also found that all the teachers and students were satisfied with the curriculum and evaluation procedures under semester system examination. The teachers were satisfied with the implementation of semester system at undergraduate level in relation to feedback and evaluation procedures. Students viewed that they were not getting the result in time, which was a major issue in the semester system.

Chongbang (2014) conducted mini research entitled "Comparative Study of Semester system and Annual system of faculty of education" had been conducted to compare semester system and annual system of Faculty of Education by exploring realities of teaching learning activities, classroom management and student achievement, identifying administrative and academic roles and responsibilities; and eliciting reactions of primary stake holders. The study had been delimited to the constituent education campuses of Kathmandu valley. The research was based on mixed method design which had employed multi-methods and tools, and multi-data sources. Three campuses and three administrative authorities (central and campus level) were selected through purposive sampling technique. Twelve students from semester system were selected through random sampling technique, six students from annual system through stratified random sampling and two students through referral sampling. Tools like interview guide, questionnaire, observation and FGD guide had

been used to collect primary data. Student achievements had been collected from official records of respective campuses and office of examination controller.

The quantitative and qualitative data collected from the field had been analyzed on the basis of themes like class room realities, roles and responsibility and reactions of primary stake holders. The two systems were different more in practice rather than in their policy. The teaching learning strategies mentioned in the syllabus didn't show difference between the two systems. But faculties employ permissive, constructive and IT familiar teaching learning strategies like group interaction, class and home assignment, presentation of assignment on slide and question answer in semester system class. On the other hand, faculties used repressive, IT strange and instructive strategies like lecture and dictation from teacher's note were the common teaching learning used in annual system. Some teacher used two different sets of instructional strategies in the two different systems. The determinants of distinct classroom strategies were: students' motivation, number of students in class, internal evaluation/ continuous evaluation system. Hence, the higher education pedagogy had entered to the new paradigm in practice. The pass percentage in the semester system was higher than the annual system in terms of total students of program and three compulsory subjects (Foundations of Education, Curriculum and Educational Psychology). These research findings had contributed to reform the policies of semester system and to build up the confidence for upcoming large scale implementation of semester system under Faculty of Education.

G.C. (2019) Conducted mini research entitled "Issues and Challenges of Semester System and its Solution" under Tribhuvan university. The main objective of this study was to explore the existing practices of the semester system in the Tribhuvan University. Beyond this, to found the major issues and challenges of the

semester system and to cope up with the ways to resolve the problems in the university were remaining objectives of this research. The study site of this research was Kathmandu valley in which the constituent colleges of TU, Central Department of Education, Kirtipur, Mahendra Ratna Campus, Tahachal, Sanothimi Shikshya Campus, Bhaktapur and the affiliated college such as Janamaitri Multiple Campus, Kuleshwor. The four teachers who had taught in degree in the semester and the two experts who had known about the semester system were the sample of this work. In the same way, the four administrative staffs and the regular students of the semester system also were the sample of this research. Data collection techniques were observation, focus group discussion and interview guidelines in this research. Data had analyzed the generated information with thematically depending up on the observation checklist, interview and the focus group discussion guidelines and blended the information with the theory and drew the conclusion of this research work.

The major findings of this research were the practice of the semester system was quite different from annual system in various ways. Similarly, there was more utilization of the student centered methods rather than that of the teacher centered methods to deliver the content by the teacher in the classroom, students regularly attend in the classroom and their active participation in the subject matter. Likewise, students' enrollment was quite less than that of the annual system in which affiliated colleges had a few students in comparing with the constituent colleges.

Bista (2016) conducted research study on the topic "Opinion of Teachers towards Semester System in Mathematics Education" was carried out to find the opinion of teachers towards semester system and problem of implementation of semester system in mathematics education. This study helped its stakeholders for the

effective implementation. The research was prepared on theoretical and conceptual framework. The researcher selected mixed approach, sequential and exploratory in design. The research was carried out from all the teachers of mathematics education and other faculties' teachers of mathematics education. Data were analyzed qualitatively and quantitatively. Questionnaire and interview guideline were used as tool for the study of this research. In Questionnaire mean score and percentage of each statement were calculated to determine the teacher's opinion towards semester system. If mean was less than 3 (less than 60%), the given statements show there was problem in implementation of semester system. Also, interview from four teachers of Mathematics Education Department. The collected information were systematized and analyzed descriptively. The result of the study showed that, teachers have positive opinion towards the semester system. Teachers used different set of activities, continuous evaluation was carried out. The semester system was more efficient than annual system.

Khaniya (2014) published an article in *The Himalayan Times* on the topic "Semester system in TU: Promise or peril?" There were certain features of a semester system. A semester involved 15-20 weeks' rigorous study Compared to the annual system, it involved focused attention of students and teachers on teaching and learning; it was more organized and interactive in the classroom because it involved pedagogical processes instead of methods, the number of students (quota) in the classroom was fixed; they were selected on a merit basis based on an entrance exam; they were kept busy at the same level of burden throughout the session; they were required to be regular for completing tasks and projects and participated in group discussions and presentations; and internal assessment was adopted for reducing over-dependence of external evaluation.

Subedi (2019) published article in the journal *Interdisciplinary Research in Education* on the topic "Perception of students and teaches towards the semester system of Tribhuvan University". This paper indented to analyze perceptions of students and teachers towards the semester system of Tribhuvan University (TU). The result of the study was based on the data collected through survey questionnaire from 40 university teachers and 194 master level students. The perception was discussed in terms of learning environment, resources, use of ICT tools, contents and activities. The findings showed that the perception of teachers and students towards curriculum, teaching/learning environment, and regularity of classes and viability of semester system were in positive direction. However, the availability of learning resources and use of ICT tools in day to day teaching/learning were not in satisfactory way in the perception of the participants. Their perceptions also revealed that facilities of extra-curricular activities, play grounds and canteen were inadequate. Similarly, the teachers and students perceived that availability of both human and academic resources was inadequate. The students experience showed that there was teacher domination in selection of teaching methods; less used of ICT materials to promote learning; difficulty in completing courses in the stipulated time and not timely declaring exam result. However, this system had encouraged and empowered creativity among students for learning.

Pathak and Rahman (2013) published article in *The Journal of Education and Practice* on the topic "Perception of Students and Teachers towards Semester System: A Study in Some Selected Degree Colleges of Nagaon town of Nagaon District of Assam" under Krishna Kanta Handiqui State Open University. The present study was conducted on 133 undergraduate students and 44 teachers selected at random from four selected degree colleges affiliated to Gauhati University from Nagaon town of

Nagaon district of Assam to find out their perception towards semester system. Self-structured questionnaire revealing perception towards five dimensions of semester system- curriculum, syllabus coverage and regularity of classes, teachers and methods of teaching, evaluation and feedback, and availability of resources was administered. The collected data were analyzed through using frequency, percentage, mean and standard deviation. The research result revealed that the perception of students towards internal assessment and overall evaluation was not quite satisfactory. Most of the respondents even didn't understand the evaluation in CGPA. The study further revealed lack of required resources particularly information resources in degree colleges to make semester system effective and successful. In this way, the findings of the present study yielded the necessity of developing strategies by all the stakeholders to arrange for minimum resources and facilities which had a direct bearing on students' achievement.

Batool and Ahmad (2009) published an article in World Academy of Science, Engineering and Technology International Journal of Educational and Pedagogical Sciences on the topic A Study of Students' Perceptions Regarding the Effectiveness of Semester and Annual Examination System at Institute of Education and Research . The research showed that the art of the examination was probably the most difficult one in the whole range of educational practices. The main purpose of the study was to investigate university students' perceptions regarding the effectiveness of semester system and annual system. The study was quantitative in nature. The sample consisted of 200 students. A five point Likert type scale was used to collect the data. The statistical measures like frequencies, mean, standard deviation, and One Way ANOVA test were applied to analyze the data. The major findings of the study indicated that in semester system students did not spend much time in political

activities and develop their study habits. It also revealed that annual system of examination did not satisfy the educational aspirations of the student.

Sharma and Subedi (2018) published an article in Tribhuvan University Journal on the topic "Semester system in Nepal: Taking a Collaborative, Constructivist Approach to Teacher Training". In the context of social and education change in Nepal, this article described and reflected on a unique teacher training model that evolved from a Webinar discussion series into an initiative for training an increasing number of faculty members across the country. Through the discussion, it showed that for Tribhuvan University's and Nepal's effective transition into semester-based education to become successful and productive, institutions and their administrative and faculty members must put the change and improvement in teaching/learning approach at the top of their list. It concludes by drawing lessons from the program and making recommendations for sustainable and institutionalized initiatives toward educational change through faculty development.

Chemjong (2018) conducted survey type research entitled "Student's perception towards the semester system in Mathematics Education". The objectives of this research was to find out the students' perception towards semester system in mathematics education .The sample of this study consists of 65 mathematics students selected randomly from Tribhuvan University Kirtipur. A set of questionnaire entitled "Likert attitude scale" was the tools for data collection. The questionnaire consists of 42 statements for students. These questionnaires consists different aspects of perceptions towards the semester system of curriculum, learning resources, use of ICT, students' satisfaction, and future existence of semester system. The collected data were organized, tabulated, analyzed and interpreted by using statistical tools such as, percentage, mean, standard deviation was employed to find out the perception of

students towards the semester system. The result of this study indicated that the university students had positive attitude towards the semester system and found that there was no significance difference between the students' perception of curriculum, learning resources, use of ICT etc. Researcher had tried to find out the students satisfaction level of semester system. So, the perception in the average was positive towards the semester system.

Research Gaps

A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Overall review of related literature shows that semester system is an educational system where exams are conducted after six months. It involves focused attention of students and teachers on teaching and learning; it is more organized and interactive in the classroom because it involves pedagogical processes instead of methods, the number of students (quota) in the classroom is fixed; they are selected on a merit basis based on an entrance exam; they are kept busy at the same level of burden throughout the session; they are required to be regular for completing tasks and projects and participate in group discussions and presentations; and internal assessment is adopted for reducing over-dependence of external evaluation. During my literature review, I found a lot of researches were done on semester system related with different aspects. But I didn't find any research done to explore challenges and opportunity of semester system in depth qualitative design. I found the gap there. So, through this research I explored the challenges and opportunity of semester system in Mathematics Education.

Theoretical Literature Review

Review of theoretical literature provides an insight to researcher related to a number of aspects that have direct or indirect assistance the research topic. It serves as a basic for developing a theoretical framework which helps to investigate the problem that researcher wishes to do. I would go through different theoretical concepts to support this study which would help me to develop the insights regarding the topic. These theoretical ideas in relation to the topic are presented in the following sub – sections.

Transformative Pedagogy

"Transformative pedagogy" borrows from research in the context of collaborative teaching and learning (Vygotsky,1978 as cited in Farren, p.2016).It aims to create conditions that support participants in constructing understanding by way of pedagogical dialogue and peer-peer interactions among pupils, by way of collaboration among teachers in inquiring into their practice, and by way of more dynamic alliances between school and society. Pedagogical dialogue involves negotiation between teachers and pupils about content and process of learning as well as participated outcomes. It "supports pupils in developing their relations with the content and process of their learning "(Little,2001,p.50 as cited in Farren,2016).In other words, it acts as a dynamic that supports participants in developing the capacity to accept greater responsibility for teaching and learning. In transformative pedagogy, teachers are understood as critical inquires who construct knowledge out of practice in conjunction with their colleagues. Teachers are advocates of improvement in classroom and school life that is implied in the concept of 'being-in-becoming'. In addition, they are participants in wider society(being –in –relation) who have

responsibility for expressing their understandings and for self –directing (e.g. planning, monitoring, self-assessing,evaluating),and by implication for critiquing issues that pertain to young peoples' life in wider society. Teachers and pupils, as participants, share responsibility for transforming their understanding about how being and becoming in the world are shaped by the moral-ethical values they hold."Transformative pedagogy" is therefore action-oriented (Farren,2016).

Transformative pedagogy is defined as an activist pedagogy combining the elements of constructivist and critical pedagogy that empowers students to examine critically their beliefs, values, and knowledge with the goal of developing a reflective knowledge base, an appreciation for multiple perspectives, and a sense of critical consciousness and agency. Transformative learning include open spaces for dialogic learning and immersion in authentic learning experiences (Omiunota,2009).

Transformative pedagogy supports target mathematics teachers in developing a more encompassing professional identity as practitioner –researcher and leaders in the school and wider community. It enhances the social-psychological model of autonomous mathematics teaching and learning by underpinning it with a critical, intercultural and moral-philosophical basis. 'Transformative pedagogy' gears teaching towards learners and learning. Learners are understood as whole persons with an identity as critical and intercultural mathematics users for whom interactions are informed by moral values. An original model for 'transformative research ' is shown and is aimed at supporting practitioner-researchers and leaders in general and also supports mathematics teachers, students in becoming more self-aware, critical, collaborative, and morally conscious educators. Doing this implies having the capacity and courage to take a moral stance for all students, not least those who are

marginalized and helping them to improve their life chances and their understandings what being in the world means (Farren, 2009).

The process of transformative pedagogy opens the door for the development of problem-solving skills that promote active responses within the larger society, making transformative pedagogy far more than the transmission of information. It also expands the view of students and teachers alike, leading to greater self-awareness, deeper compassion for others and a commitment to produce change in self and the world. Transformative pedagogy is closer to collaborative approach. The power is more likely to be shared between students and teachers. The curriculum focuses on problems and solutions by both teachers and students and they jointly construct meaning that informs learners' personal growth. Learning is measured by observing each student's growth and thinking process, inquiry process, and students' predisposition to lifelong learning (Vijaychandran, 2009).

The Systems' Theory Approach

This research is predicated on a general systems' theory approach. Systems theory originates from Bertalanffy's General System Theory (GST). A Systems 'view is a worldview based on the discipline of systematic inquiry. In the most general sense, system means a configuration of parts connected and joined together by a web of relationships. A system is a group of interrelated, interdependent and interacting activities that form a coherent whole. If any of the parts or activities in the system seems weakened or misaligned, the system makes necessary adjustments to achieve its goals more effectively. For example, if students do not receive feedback on their assignments before they write exams, the system is not effective. One of the dominant goals of a system is that it is driven by a survival motive, and a feels need for stability (which ties in with the survival motive). A system is designed to be self-

maintaining, and in this process of self-maintenance, as a system generates creative forces within itself that enable it to alter circumstances; in short, the system cannot remain healthy if it precludes the possibility of change (Cain, 1999:15 as cited in Plessis, E.C. and Pretorius, F.J., 2013). One of the biggest breakthroughs in how people understand and guide change in organizations is based on systems' theory and systems' thinking. Furthermore, context is a key concept within general systems' theory. For example, who are our students and where are they situated, that is, what does our student profile look like? The focus is on the interactive processes of which the individual is a part. In systems' theory, the relationship between organizations and there is recognized as the first source of complexity and interdependence (Plessis, E.C. and Pretorius, F.J., 2013).

Digital (ICT based) Pedagogy

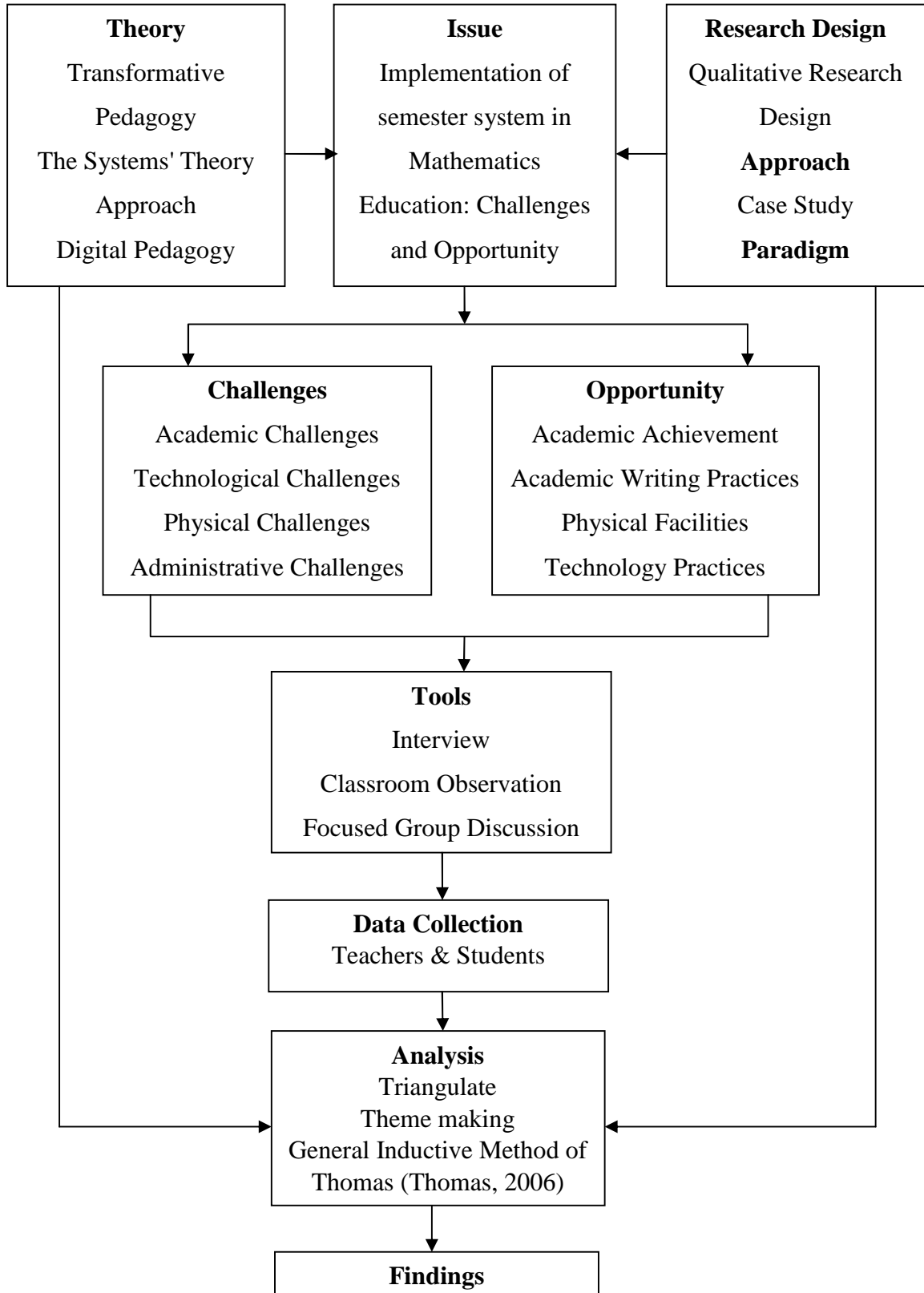
Emerging from Distance Learning, Digital pedagogy has brought numerous changes in the field of education. Over a century ago, the distance learning started at The University of London in 1850's and gave freedom to Higher Education (Kumar, 2019). Digital technologies are being integrated into educational institutions with the aim of bettering the education of skills needed in the 21st century. Digital pedagogy is the study and use of contemporary digital technologies in teaching and learning. Digital pedagogy may be applied to online, hybrid and face to face learning environments. It focuses on the roots of theory of constructivism and transformative pedagogy. Digital pedagogy includes computer, the internet, social media, projector, presentation, digital whiteboards, flipped classroom, zoom, Microsoft team, mobile phone, television, application software, preparing E- Content, email, blogs, video conferencing, problem solving skills, Geo-gebra and Mathematica etc. Now there is possibility of using ICT both as content and as a method. One of the purposes to

introduce ICT in education is support effective learning. The pedagogical rationales of using ICT are to utilize technological tools in enhancing learning, flexibility and efficiency in curriculum delivery (Bhattarai, 2019). Use of ICT-integrated pedagogy can transform the dynamics in math classes, making the lectures integrated to practice and providing resources that help in securing content and approach of theory with everyday life. ICT can be used in a mathematical laboratory that help develop intuition, conjecture, prove, show and “see the mathematical situations” in a practical way.

For this, ICT has become a valuable teaching tool, offering great possibilities to education. It can produce significant changes in teaching methods and the way in which students can access and interact with the mathematical knowledge (Hofmann, 2006 as cited in Bhattarai, 2019). If ICT integrated pedagogy works as expected the student who do not get chance to attend their regular classes will not miss their mathematics classes as well as each students will have opportunity to understand any concepts at their own pace. Information communication technology integrated pedagogy is defined as the teaching learning process and environment where the students have the access of getting /having the teacher’s class presentation as a learning aid at their needs with flexibility of time and space. Students can view the teacher’s class presentation at their home using ICT tools and using this they can solve the assigned problems themselves at home. Hence the ICT based pedagogy will be the best strategies for mathematics teachers and students in semester system(Bhattraai, 2019).

Conceptual Framework

A conceptual framework is a representation, either graphically or in narrative form, of the main concepts or the variables and their presumed relationship with each other. The research was conducted on the basis of following framework:



The conceptual framework is the blueprint which provides an outline of how we plan to conduct our research. The conceptual framework which I mentioned above is the important part of this study. This research was centered within the Central Department of Mathematics Education. Challenges and Opportunity of semester system in Mathematics Education was the objective of this study. This study was guided by Transformative Pedagogy, The system's Theory Approach and Digital Pedagogy. I have applied Qualitative research design and case study approach to find challenges and opportunity of Semester System. I collected the data by using tools like interview, observation and focus group discussion. After collecting the data I analyzed the data and finding.

Chapter III

Research Methods and Procedures

Research Methodology is a science, which determines how to complete the research systematically. It is an important aspect of research work. Authenticity and reliability of any research depends upon the tools and methods which are used for data collection. Thus this chapter includes research design of the study, research paradigm of the study, study site, sample of the study, data collection tools, data collection procedures, data analysis and interpretation procedures and quality standards.

Research Design

Research designs are plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Cresswell,2009). Research design is the conceptual structure, strategy of logical, systematic plan and direction of research. There are various research designs like quantitative, qualitative and mixed method. Among of these, I had followed the qualitative research design in this study. Qualitative research is a generic term for variety of research approaches that study phenomena in their natural settings, without predetermined hypothesis. Qualitative research design has several characteristics such as naturalistic enquiry, context specific, human as instrument, emergent design, inductive analysis, descriptive data, personal contact and insight, unique case orientation, empathic neutrality and dynamic systems. There are various types of qualitative research such as Case study, Ethnography, Narrative enquiry, Phenomenology and Grounded theory(Khanal,2073). Among of these, I had adopted case study as my research design. Case study research is a qualitative approach in which the investigator explores a bounded system(a case) or multiple bounded

system(cases) over time, through detailed, in depth data collection involving multiple sources of information(e.g. observations, interviews, audio visual material, documents and reports), and reports a case description or case-based themes(Khanal,2074). Case studies are a strategy or inquiry in which the researcher explores in depth a program, event, activity, process or one or more individuals(Cresswell,2009).

A case study is a specific instance that is frequently designed to illustrate a more general principal; it is 'the study of an instance in action. The single instance is of a boundary system, for example a child, a clique, a class, a school. Case studies can establish cause and effects in real contexts, recognizing that context is powerful determinant of both cause and effects(Cohon,2007).Case studies are set in temporal, geographical, organizational, institutional and other contexts that enable boundaries to be drawn around the case ; they can be defined with reference to characteristics defined by individuals and groups involved; and they can be defined by participants' roles and functions in the case (Hitchcock and Hughes 1995:319,cited in Cohen,2007).

The various researches, news and articles showed that the implementation of semester system in any institution is very difficult as a new program. Such new program 'Semester System' is also implemented in the Central Department of Mathematics Education Kirtipur, Tribhuvan University. Thus, implementation of semester system in Central Department of Mathematics Education Kirtipur, Tribhuvan University was the case for my study. The study would try to find the challenges and opportunity of semester system in Mathematics Education.

Research Paradigm

A research paradigm is defined as a “set of common beliefs and agreements” shared by researchers regarding “how problems should be understood and addressed”

(Kuhn, 1962). Therefore, this is a specific way of perceiving the world (a worldview) that shape how we seek answers to research questions. As Guba (1990) argued, a research paradigm is mainly characterized by its ontological, epistemological and methodological dispositions. The research paradigm for the study would be interpretivism. In this paradigm, researchers see themselves “within the circle”, interpreting the world around them. They have an epistemological position of that of someone co-creating and sharing knowledge, as well as creating relationships furthering their understanding of different points of view. The research carried out is subjective, where results can be influenced by the opinions of the researcher. Data collected in interpretive research is ‘rich’ data, which is usually qualitative, although quantitative data can be collected as well. (Basseyno date cited in Pollard 2002: 38) defines once more the meaning of interpretive research when he mentions “To the interpretive researcher, the purpose of research is to describe and interpret the phenomena of the world in attempts to get shared meaning with others”.

The position of interpretivism in relation to ontology and epistemology is that interpretivists believe the reality is multiple and relative (Hudson and Ozanne, 1988). Lincoln and Guba (1985) explain that these multiple realities also depend on other systems for meanings, which make it even more difficult to interpret in terms of fixed realities (Neuman, 2000). The knowledge acquired in this discipline is socially constructed rather than objectively determined (Carson et al., 2001, p.5) and perceived (Hirschman, 1985, Berger and Luckman, 1967, p. 3: in Hudson and Ozanne, 1988).

Interpretivists avoid rigid structural frameworks such as in positivist research and adopt a more personal and flexible research structures (Carson et al., 2001 as cited in Edirisingha, 2001) which are receptive to capturing meanings in human

interaction (Edirisingha, 2001) and make sense of what is perceived as reality (Edirisingha, 2001). They believe the researcher and his informants are interdependent and mutually interactive (Hudson and Ozanne, 1988). The interpretivist researcher enters the field with some sort of prior insight of the research context but assumes that this is insufficient in developing a fixed research design due to complex, multiple and unpredictable nature of what is perceived as reality (Hudson and Ozanne, 1988). The researcher remains open to new knowledge throughout the study and lets it develop with the help of informants. The use of such an emergent and collaborative approach is consistent with the interpretivist belief that humans have the ability to adapt, and that no one can gain prior knowledge of time and context bound social realities (Hudson and Ozanne, 1988).

Therefore, the goal of interpretivist research is to understand and interpret the meanings in human behavior rather than to generalize and predict causes and effects (Neuman, 2000; Hudson and Ozanne, 1988). For an interpretivist researcher it is important to understand motives, meanings, reasons and other subjective experiences which are time and context bound (Hudson and Ozanne, 1988; Neuman, 2000). Personally, I believe myself to be within the interpretive paradigm. My ontological position in education was that of someone sharing knowledge with others to understand the world around us. I believed it was important to have good relationships with people, to enable the knowledge they had and the knowledge I had come together in order for effective learning to take place. By using interpretive research methods I have been able to become part of the research and fully gauge and understand teachers, students and staff members' opinions about implementation of semester system in mathematics education.

Study Site

In dealing with purpose of my research, I selected Central Department of Education, Department of Mathematics Education and Tribhuvan University Kirtipur, Kathmandu as my study site.

Sample of the Study

Sample size of qualitative research is not fixing. There are no rules for sample size in qualitative inquiry. Therefore, the sample size of this study depends upon the researcher what she/he wants to know, what the purpose of the research was, what can be credibility of the study and what can be done with available time and resources (Khanal 2074). Thus for the sample of my study, I had selected 6 mathematics teachers, 10 students and three education experts from Department of Mathematics Education Kirtipur, Kathmandu by the purposive sampling.

Data Collection Tools

Research tool is the most important part for the data collection in the study. On the basis of data collection technique we can study and analyze every aspect of the study. In this study the researcher intended to find the practice, challenges and opportunity of semester system in Mathematics education. To fulfill the purpose of the study adopted the following tools as tool for the data collection:

Interview Guidelines

It is main method for collecting primary data where person verbally collect information. In qualitative interviews, the researcher conducts face-to-face interviews with participants, interviews with participants 'by telephone, or engage in focus group interviews, with six to eight interviewees in each group. The interviews involve unstructured and generally open-ended questions that are few in number and intended

to elicit views and opinions from the participants (Cresswell,2009). Interviewing is a data collection procedure involving verbal communication between the researcher and respondent either by telephone or face - to -face situation (Eckhardt and Ermann, 1997,p.240). I carried out semi-structured and depth interview from teachers of Mathematics Education.

Observation Checklist

Observation is a systematic data collection approach. Researchers uses all of their senses to examine people in natural settings or naturally occurring situations. In participant observation, the observer actively participates and become an insider in the event being observed so that he/she experiences events in the same way as the participants. In this study, participants' observation had used to record the evidences of live class room teaching-learning activities and class room management (Khanal,2074).

Focus Group Discussion(FGD)

The focus group discussion (FGD)is a rapid assessment, semi-structured data gathering method in which a purposively selected set of participants gather to discuss issues and concerns based on a list of key themes drawn up by the researcher/facilitator. Focus Group discussions more than a collection of interviews. Data are generated by interaction between group participants. Participants' presents their own views and experience, but they also hear from other people. They listen, reflect on what is said, and in the light of this considers their own standpoint further. In this study, I had used FGD to collect information from students (Khanal,2074).

Data Collection Procedure

In this research, I selected the central department of mathematics education, Kirtipur Kathmandu as my study site purposively in the beginning. Secondly, I prepared interview guidelines, observation guidelines and focus group discussion guidelines as information generation tools. Then I met mathematics lectures and professors individually. I made them clear about the purpose of my research and importance of their help. Then, I conducted depth interview to the lectures and professors with both structured and unstructured questions. Thirdly, I met mathematics students of fourth semester. Then, I selected ten students for FGD and conducted FGD about challenges and opportunity of semester system. Then I also observed classroom for classroom observation. Finally, I managed to keep the collected information from observation, recording and note taking process. Data of this research was the current practices of the semester system in the central department of mathematics education, facing challenges by teachers and students in this new system and some opportunity of this program. Observation checklist used in the classroom to assess the current practices of the semester system where as interview and FGD used to probe major challenges of the program. I recorded the major information obtained from interview and FGD guidelines in audio and video form and I even made the field note.

Data Analysis Process

By using above mentioned tools I collected the information from the field. After the collection of data from the field, I analyzed the data from systematic way and I also interpreted the data from qualitative way like with the triangulate, theoretical blends and through inductive approach. Similarly, I had shown the clear image of the students and teachers and towards the challenges and opportunity of

semester system. In addition to this, I observed some classes of mathematics education regarding its practice, challenges and opportunity.

After collecting the data or information from the field, I tried to triangulate them in theoretical basis. Similarly, I blended information with major theories and drew their major themes. Managing the generated information theoretically, I assessed the theme and made some clear way to cope up with the measures to reduce the challenges of the semester system. Finally, I managed the quality standard of the information analysis process and validated such information in this research. In which the analyzing process of information made theme from the responses of the respondents and blended them to theory and the research paradigm. In the same way, I used the general inductive method of Thomas (Thomas, 2006) to analyze the information. According to Thomas (2006), the following procedures were used for inductive analysis of qualitative data:

1. Preparation of raw data files (data cleaning)
2. Close reading of text
3. Creation of categories
4. Overlapping coding and un code text
5. Continuing revision and refinement of category system

This method argued the conclusion drawn by analyzing the information inductively.

Qualitative Standards

Lincoln and Gubba(1985) propose four criteria for 'Naturalistic' research. As their work to 'formalize rigor' has been particularly influential in social science generally, and in the occupational therapy field specifically, it is worth focusing on their categories in some depth. Interestingly, they link their criteria with four used in

conventional quantitative inquiry: those of internal validity, external validity, reliability and objectivity.

Credibility

This concept replaces the idea of internal validity, by which researchers seek to establish confidence in the 'truth' of their findings. Lincoln and Gubba(1988) recommended several techniques inquirers may use to enhance the credibility of their research: prolonged engagement, persistent observation, triangulation, peer debriefing, negative case analysis, progressive subjectivity checks and member checking, and Peer review in the field.

Triangulation of data means the collection of data through the multiple sources to include interview, and document analysis(Cresswell,2009).In this study, I used multiple sources of data to confirm emerging findings. Also, I used multiple stand point to analyze the collected data using reviewed literature.

The member checking ensures the truth value of data (Cresswell, 2009). In this study, I performed the member check by sending participants a copy of their views. The next method that I used to increase the truth worthiness is the prolonged engagement in the field. To maintain credibility of the research, I tried to spend as much as time for observation and engaging with participants with their work. After getting information, I wrote notes, asked similar types of question to others people and tried to find real practices, challenges and opportunity of semester system in mathematics education from those information.

Transferability

Transferability replaces the concept of external validity. This criterion refers to the applicability of findings in one context(where the research is done) to other

contexts or settings (where the interpretations might be transferred). To maintain transferability, I explained practices in the particular community briefly. I included photos related with practices, challenges, and opportunity of semester system in Mathematics Education in my research. I tried to capture most of scenario by using thick description of observations, interviews and then making meaning in the research (Acharya,2017).

Dependability

This concept replaces the idea of reliability i.e. the issue of dependability refers to the idea of another researcher being able to repeat same work, in the same context, with the same methods and participants, and get similar results. This is the third standard for judging qualitative studies and refers to the stability or consistency of the inquiry processes used over time. To maintain it, I collected document all processes in detail, and then I shared with advisors to get in evaluation to help the the process to conform dependability(Acharya,2017).

Conformability

A fourth standard is conformability, which refers to the quality of the results produced by an inquiry in terms of how well they are supported by informants (members) who are involved in the study and by events that are independent of the inquirer. This is sometimes referred to as the audit trail (a record of how decisions were made throughout the study). To maintain conformability, the research before concluding information I reviewed those information several times and conform those information to relatives before concluding information as well.

Ethical Consideration

Ethical consideration cab be specified as one of the most important part of the research. "The term "ethics" usually refers to the moral principle and guiding conduct,

which are held by a group or even a profession" (Wellington, 2015). Research ethics provide a guideline or set of principles that support researchers in conducting research so that it is done justly and without harming anyone in the process. It is the duty of researcher to ensure they are carrying out their project in line with established ethical standards. Every step of the research project , from formulating your research question to publication, needs to be informed by ethics to ensure integrity of the project. (Hickey, 2018).

I took care of the given ethical consideration during my research

-) I paid attention to accuracy, honesty and truthfulness of data.
-) The study was aware about plagiarism.
-) I took permission before entering the research site.
-) I took the permission of respondent before taking their interviews.
-) The study was careful about the ethical issues and assured to avoid the potential harm in future.
-) I assured not to share received data for further study or experiment.
-) I took photographs, audio record and video record only after taking their permissions.

Chapter IV

Analysis and Interpretation

This chapter deals with the analysis and interpretation of the collected information derived from the case study during the research period. Analysis of data is a process of inspecting, cleaning, transforming and modeling with the goal of highlighting useful information, suggestions, conclusions and supportive decisions making (Best and Khan,2009).According to Cohen(2007),qualitative data analysis involves organizing, accounting for and explaining the data; in short, making sense of data in terms of the participants definitions of the situation, noting patterns, themes, categories and regularities.

The process of the data analysis involves making sense out of text and image data. It involves preparing the data for analysis, conducting different analysis, moving deeper and deeper into understanding the data (some qualitative researchers like to think of this as peeling back the layers of onion), representing the data, and making the interpretation of the layer meaning of the data. Data analysis involves collecting open-ended data, based on asking general questions and developing an analysis from the information supplied by participants (Cresswell,2009).

Data interpretation refers to the implementation of processes through which data are reviewed for the purpose of arriving at an informed conclusion. The interpretation of data assigns a meaning to the information analyzed and determines its signification and implication.

The importance of data interpretation is evident and this is why it needs to be done properly. Data are very likely to arrive from multiple sources and has a tendency to enter the analysis process with haphazard ordering. Data analysis tends to be extremely subjective. That is to say the nature and goal of interpretation will vary

from one sector to another. While there are several different types of processes that are implemented based on individual data nature, the qualitative analysis is a broadest and most common category

Qualitative data analysis can be summed up in one word- categorical. With qualitative analysis, data is not described through numerical values or patterns but through the use of descriptive context. In this qualitative data analysis procedure observation, interview and focus group discussion (FGD) techniques are included.

Data analysis and interpretation help improve processes and identify problems. It is difficult to grow and make dependable improvements without, at the very least, minimal data collection and interpretation. So, without proper research and analysis, an idea is likely to remain in a stagnant state forever. This type of interpretation supports to informed decision making, anticipating needs with trends identification, cost efficiency of the program, clear foresight in the near future and other decisions towards the running program like semester system in the Central Department of Mathematics Education.

In this chapter I have interpreted the collected information according to the research questions mentioned in the chapter one. For this I selected the central department of mathematics education, Kirtipur Kathmandu as my study site purposively in the beginning. Secondly, I prepared interview guidelines, observation guidelines and focus group discussion guidelines as information generation tools. Then I met mathematics lectures and professors individually. I made them clear about the purpose of my research and importance of their help. Then, I conducted depth interview to the lectures and professors with both structured and unstructured questions. Thirdly, I met mathematics students of fourth semester. Then, I selected ten students for FGD and conducted FGD about challenges and opportunity of semester

system. Then I also observed classroom for classroom observation .After assessing trustworthiness by doing triangulation between the data collected from interviews, observation and FGD, I have analyzed and interpreted the obtained data on the basis of research question, objectives and the conceptual framework of the study under the following main theme.

Existing Practices of semester system in Mathematics Education

This section is related to the first objective of this research and the first research question. Such objective and the research questions are directly linked with the existing practices of the semester system in the university. Some of the major aspects of this section are as follows:

The semester system has short history in the academic sector of TU. After National Education System Plan-2028, was implemented in higher level of education in TU at first some of the challenges created the system to be its failure. After ten years at 2037 BS after three decades, this program had been launched in the Tribhuvan University, the oldest university of the nation, as a master degree program. It was inaugurated in 2072 BS in the master level of the university as a pilot program. This program has its own practices in its constituent and affiliated college. I have specially analyzed the practice of semester system in Central Department of Mathematics Education.

Existing Student Enrollment Practices of semester system in Mathematics Education

Student enrollment is the process of arranging to attend an institution and specific classes. Student enrollment is a process of ensuring attendance in an educational institute and also in a specific classes. Student enrollment also refers to the act of registering for school, college, university. The process of enrollment is

finished once the students are admitted to any specific school or college or university. The students have choice to select any courses available in the university. Initially, they go through the information service on the web and then go ahead in their selection procedure.

A system is set in a place by schools, college. This term may also have describe the number of students that currently attend a course. Student's enrollment refers to the act of signing up for school and or specific classes or co- curricular activities at that particular school. The enrollment process is completed after a student is granted admission to a particular school. Students can then select courses to take through their school's online students information service. In this research I have selected Central Department of Mathematics Education. In Central Department of Mathematics Education, I have found the new practices of student enrollment process. They have followed the rules of Dean's office in terms of student enrollment process. In the further process, I took interview with professors, lecturer, students and responses of them are listed below:

Participant no.1 lecturer mentioned his views about the existing student enrollment practices of the semester system in this way:

Before the implementation of the semester system, we used to teach 400-500 students, but in 2070 when the semester system came in effect only 400 students got admitted and we conducted their classes in the morning and day shifts. Then, in the second and the third batches we ran classes in four sections and in the next batch we had only two sections and currently we only have one section. I think it is either due to the semester system or the difficulty level of mathematics.

Participant no.2 professor mentioned his views about the existing student enrollment practices of the semester system in this way:

Country-wise entrance exam is conducted by the Dean office by setting a specific criteria. Based on the marks obtained by the students in the Bachelor's level and the subjects studied, students appear for the entrance exam for the Master's Level. The entrance exam consists of objective questions for 100 marks where the students are expected to score 50% marks.

Participant no.3 professor mentioned his views about the existing student enrollment practices of the semester system in this way:

The number of students enrolling has decreased. Previously in the annual system, job-holders were also able to enroll and appear for the exam without attending the classes. But now 80% attendance is mandatory. Active participation of students now holds specific marks. Because of these reasons, working students are unable to get admitted. In my point of view, more than the effects of the semester system, it is the lesser number of population interested to study at this level which has caused the reduced number of enrollments.

Participant no.4 previous student mentioned his views about the existing student enrollment practices of the semester system in this way:

I had come from my village with a pledge that I will work and study together and got admitted in Tahachal Campus. But after interactions with my seniors I found out that the Central Department provides a better learning environment, daily assignments and feedbacks, group works, presentations, etc. and then I got attracted to the Central Department of Mathematics. After I filled up the

form and appeared for the entrance exam of the CDM. The exam contained objective questions of 100 marks which were average questions from the Bachelor Level's Education and Mathematics subjects. For that particular entrance, I studied from an entrance preparation book which I had bought from a nearby stationary and also focused on the subject matters of the Bachelor's level. Thus, I scored quite well in the entrance examination and finally made it into the Central Department of Mathematics Education.

In FGD, 10 Students of M.Ed fourth semester present their opinions about the existing student enrollment practices of the semester system in this way:

I had come to Kathmandu from my village to study Master's degree in T.U. I found that it was necessary to qualify the entrance exam for admission. so accordingly I collected all my documents and filled up the form. Then, I appeared for the exam which consisted of 100 objective questions. I studied my books from the Bachelor level and it was enough for me to crack the entrance exam. Then, I got myself admitted and started studying.

In the above view, I have found that it was necessary to qualify the entrance exam for admission in the Central Department of Mathematics Education. Country-wise entrance exam is conducted by the Dean office by setting a specific criteria. Based on the marks obtained by the students in the Bachelor's level and the subjects studied, students appear for the entrance exam for the Master's Level. Students have to filled up the form. Then, they appeared for the entrance exam which consisted of 100 objective questions for 100 marks which were average questions from the Bachelor Level's Education and Mathematics subjects. In this exam, students have to secure 50% marks for crack the entrance exam. Then, they can enroll in Central Department

of Mathematics Education. The number of students enrolling has decreased in semester system because in the annual system, job-holders were also able to enroll and appear for the exam without attending the classes. But now 80% attendance is mandatory. Active participation of students now holds specific marks. Because of these reasons, working students are unable to get admitted. That's why the number students enrolling semester system has decreased.

Existing Internal Evaluation Practices of Semester System in Mathematics Education

Internal evaluation system is more diagnostic evaluation system. It is used to monitor students learning style and ability to provide ongoing feedback and allow educators to improve and adjust their teaching methods and for students to improve their learning. Internal evaluation is a flexible and informal way of assessing student's progress and their understanding of certain subject matter. Internal evaluation helps students identify their strength and weaknesses and target the areas that need work. It also helps educators and governors recognize where students are struggling and address problems immediately. In this research I have selected Central Department of Mathematics Education. In Central Department of Mathematics Education, I have found the new practices of internal evaluation system. They have followed the rules of Dean's office in terms of internal evaluation. In the further process, I took interview with professors, lecturer, students and responses of them are listed below:

Participant no.1 professor mentioned his views about the existing internal evaluation practices of the semester system in this way:

As instructed by the curriculum/syllabus, three exams of 10 marks each are conducted. The first test is taken in the written form and the 30 marks is converted to 10 marks in the last exam, also taken in the written form. Firstly,

when 30% of the course is completed, then the 1st written exam is taken where 30 marks are converted to 10 marks. This exam aims to test the analytical power and written potential of the student. The 2nd exam is taken in the form of assignment which may include presentations, group discussions, etc. Lastly, as per the teacher's wish, the final exam is conducted consisting of both objective and subjective courses. After that, 5 marks for classroom activities and 5 marks for attendance is given accordingly. In such a way, the internal evaluation is done for a total of 40 marks. The external evaluation for 60 marks is conducted as per the specification grid of the Dean Office which contains both objective and subjective questions.

Participant no.2 lecturer mentioned his views about the existing internal evaluation practices of the semester system in this way:

Internal marks were given even before the semester system. In the year 2064-65, we gave 20 marks for internal assignment but it didn't prove to be effective and so was abolished. In 2070, when the semester came into effect, 40 marks were allotted for each subject as internal marks. The internal marks has different criteria including 5 marks for active participation in the class and the way the student presents himself to the class, group activities and assignments, 5 marks for regularity in the class since at least 80% attendance is mandatory to appear for the exams, 30 marks is allotted for written work and home assignments which consists of written exam for 10 marks, home assignment for 10 marks and remaining 10 marks for another written exam. Depending upon the nature of the subject, home assignment may be a project work, a seminar work, or a book review. In this way, the internal 40 marks are divided as 5 marks for active participation, 5 marks for attendance, 10 marks for first term

exam, 10 marks for 2nd assignment and 10 marks for the final internal written exam. Such a system has enabled the teachers to evaluate the students based various different criteria and also allowed the students to clear more of their doubts to learn more and also get helped for the final exams due to the timely feedbacks received from the teachers. In this way, since the students score 40 marks from internal evaluation, they only need to prepare for 60 marks in the final examination, thus reducing the burden on the students.

Participant no.3 lecturer mentioned his views about the existing internal evaluation practices of the semester system in this way:

Normally, three exams each of 10 marks are conducted. Out of the 40 marks in total, 30 marks is comprised by the internal evaluation while 5 marks for attendance and 5 for the extra-activities including the activeness of the student in the class. Also, the first and third internal exam is in the written form while the 2nd assignment involves project work, article writing, book review, etc. on the topics related to the syllabus.

Participant no.4 professor mentioned his views about the existing internal evaluation practices of the semester system in this way:

Three term tests are conducted, two of which are written exams and the second one is the assignment based which enhances comprehensive learning and the students are expected to learn new things on their own while they complete their assignments. TU aims at developing Research Based Learning and thus the second term assignment is given in accordance with this policy. These three term tests comprise of 30 marks. There should not be a difference of more than 20% between internal and external evaluation, otherwise

external mark decreases and students complain about reduced marks in their final results. Still as much as possible, the teachers remain fair to all the students.

Participant no.5 professor mentioned his views about the existing internal evaluation practices of the semester system in this way:

Basically, three assignments are given. The first assignment consists of the 1st term exam. The 2nd assignment is expected to be completed by the students at their homes itself. The 3rd assignment is the final term exam which contains questions from the full course. These three assignments are evaluated by converting 30 marks to 10 marks and for the remaining 10 marks, 5 marks are awarded for the class activity of the student and the other 5 for attendance. student misses the internal exams, he/she can re-appear for the exam. Students with less than 80% attendance are not allowed to appear for the final examination.

Participant no.6 professor mentioned his views about the existing internal evaluation practices of the semester system in this way:

If for some valid reasons, a Methods of internal evaluation differ among the teachers and subjects. Some teachers take it very seriously while some teachers take it very casually, though the teachers only give marks based upon the specific works assigned to the students. For the internal evaluation, we instruct the students to write papers and involve in group activities and re-write the paper after proper discussions. In the jurisdictions of the Education Department, a separate subject called "Contemporary Issues" has been included, within which students are instructed for literature review, preparing

objective and research question, write and present seminars. Similarly, we also take a test at the end.

Participant no.7 previous student mentioned his views about the existing student enrollment practices of the semester system in this way:

I really liked TU's internal evaluation practice. Quite fair internal exams were conducted for 10 marks and students scored exactly based on what they had written and so the students were evaluated truly on the basis of their merits. Such a practice had a very positive impact on the students since even if the student did really well in the internal exam, he still had to score higher in the final exams to maintain good result and thus the students were motivated to work harder.

In FGD, 10 Students of M.Ed. fourth semester present their opinions about the existing internal evaluation practices of the semester system in this way:

Internal exam is evaluated for 40 marks, consisting of three terminal exams. First and third term exams are pen and paper tests while the second one can be report writing, presentations, depending upon the nature of the subject. The question pattern of the first and the third exams are similar to the final exam which has a full marks of 30 and is later converted to 10.

The above information shows that internal evaluation practice is quite well which contains separate marks for attendance, active participation, presentation, group work, internal assessment. In 2070, when the semester came into effect, 40 marks were allotted for each subject as internal marks. The internal marks has different criteria including 5 marks for active participation in the class and the way the student presents himself to the class, group activities and assignments, 5 marks for regularity

in the class since at least 80% attendance is mandatory to appear for the exams, 30 marks is allotted for written work and home assignments which consists of written exam for 10 marks, home assignment for 10 marks and remaining 10 marks for another written exam. Depending upon the nature of the subject, home assignment may be a project work, a seminar work, or a book review. In this way, the internal 40 marks are divided as 5 marks for active participation, 5 marks for attendance, 10 marks for first term exam, 10 marks for 2nd assignment and 10 marks for the final internal written exam.

Existing External Evaluation Practices of Semester System in Mathematics

Education

External evaluation is the evaluation of participants where the focus is on the outcome of a program. External evaluation aims to evaluate students learning and academic achievement at the end of a term, year or semester by comparing it against a universal standard or school benchmark. External evaluation often have a high point value, take place under controlled conditions, and therefore have more visibility. In this research I have selected Central Department of Mathematics Education. In Central Department of Mathematics Education, I have found the new practices of external evaluation system. They have followed the rules of Dean's office in terms of external evaluation. In the further process, I took interview with professors, lecturer, students and responses of them are listed below:

Participant no.1 lecturer mentioned his views about the existing external evaluation practices of the semester system in this way:

External evaluation is conducted by the Dean Office for 60 marks, out of the 100 marks. The external evaluation consists of 10 objective questions for 1

mark each and for the remaining 50 marks, 2 long questions of 10 marks each and 6 short questions for 5 marks each. The setting of the question paper, conduction and management of exam and publishing the results is done by the Dean Office itself. While the publishing the results, the aggregate score of the internal and external evaluation of the student is published. The interesting thing is here is that if there is a difference of greater than 20% in the internal and external marks, then the aggregate score of the student gets reduced and is done automatically by the software. For example, if a student scores 100% marks (40 out of 40) in the internal exams but in the external exam he scores only 70% marks(42 out of 60) then as an aggregate he will only get 70%(70 out of 100). of the total marks. If a student scores 100% in the internal exams and 80% marks in the external exams, then he/she will get an average score out of the total marks.

Participant no.2 professor mentioned his views about the existing external evaluation practices of the semester system in this way:

The external evaluation is conducted by the Dean Office. The marks in the external evaluation are also in accordance with the marks sent for the internal evaluation. There is not much deviation observed among the external and internal marks.

Participant no.3 lecturer mentioned his views about the existing external evaluation practices of the semester system in this way:

The external evaluation is taken for 60 marks, which is not performance-based. Students scores in accordance with what he/she has written in the paper. The

final exam is taken for 3 hours or as per the time given. A bit of improvement and inclusion of students' needs in the exams may help make it more effective.

Participant no.4 lecturer mentioned his views about the existing external evaluation practices of the semester system in this way:

The Dean office conducts external exam for 60 marks, consisting of both objective and subjective questions from the entire course.

Participant no.7 previous student mentioned his views about the existing student enrollment practices of the semester system in this way:

External evaluation was similar to the annual system, but we had almost no fear of the external exam due to the continuous practice of internal exams. Just like before the external evaluation consists of paper-pencil test for 60% marks.

In FGD, 10 Students of M.Ed fourth semester present their opinions about the existing internal evaluation practices of the semester system in this way:

The final exam is conducted by the Dean office which has a maximum marks of 60 containing 10 objective questions for 10 marks, 20 marks for 2 long questions 6 marks each for 5 short questions.

The information shows that external evaluation is conducted by the Dean Office for 60 marks, out of the 100 marks. The external evaluation consists of 10 objective questions for 1 mark each and for the remaining 50 marks, 2 long questions of 10 marks each and 6 short questions for 5 marks each. The setting of the question paper, conduction and management of exam and publishing the results is done by the Dean Office itself. While the publishing the results, the aggregate score of the internal and external evaluation of the student is published. The interesting thing is here is that

if there is a difference of greater than 20% in the internal and external marks, then the aggregate score of the student gets reduced and is done automatically by the software.

Existing Teaching Learning Practices of Semester System in Mathematics

Education

Teaching and learning is a combined process where a teacher assesses understanding needs, establishes particular learning objectives, formulates teaching and memorizing strategies, enforces a plan of work, and assesses the outcomes of the program (Teachmit). Teaching and learning process can be defined as a transformation process of knowledge from teachers to students. It is referred as a combination of various elements within the process where an educator identifies and establishes the objectives and develops teaching resources and implements the teaching and learning strategy (Munna & Kalam, 2021). In this research, I have selected the Central Department of Mathematics Education. In the Central Department of Mathematics Education, I have found the specific practices of teaching and learning related to course content. They have followed the rules of the Dean's office in terms of the teaching and learning process. In the further process, I took an interview with professors, lecturers, students, and their responses are listed below:

Participant no.1 lecturer mentioned his views about the existing teaching and learning practices of the semester system in this way:

Being an abstract algebra tutor, I mostly have to use the whiteboard for the teaching process to keep the students engaged. I usually do not use presentations in the class. I make the students prepare their own slides on the topics and then make them submit those slides as assignments on the blog. Similarly, in other subjects, various other activities are done like seminar

paper conduct, viva exams, book reviews, etc. Also, if the students are regular in the class, they get more chances to interact face-to-face with the teachers and ask more questions. Some of the students do not ask questions even if they don't understand. But, in general, I have found the class to be interactive. Also, if the students do not understand a particular topic in the class, they study again at their homes to get a better insight.

Participant no.2 professor mentioned his views about the existing teaching learning practices of the semester system in this way:

Previously, Teacher-Centered methods were mostly used while currently Student-Centered methods are used more. This makes the classroom much more interactive. Since internal assessment is done on a daily basis, students and teachers are more active and this leads to improved instant learning. Daily involvement of students leads to students raising more doubts in the class. Also, the students complete their assignments on time. Regular presentations lead to improved active participation of the students and the teachers.

Participant no.3 lecturer mentioned his views about the existing teaching learning practices of the semester system in this way:

The teaching learning process here is quite good. Usually, our department has expert excellence, consisting of Ph.D. degree holders and scholars. So, the teaching learning practice in the Central Department of Mathematics, Education has been well and good. Also, in terms of students' benefits, the students from this department are usually toppers and crack the Teachers Service Commission exams. I teach Abstract and Linear Algebra, because of

which I mostly use Teacher-Centered approach and explain most of the things myself.

Participant no.4 lecturer mentioned his views about the existing teaching learning practices of the semester system in this way:

Usually, the lecturer method is followed. But, in recent times, students have been doing assignments, project works, presentations, blogs, and using google for assignments. In such a manner, discussion method, project method, student centered methods are being used.

Participant no.5 professor mentioned his views about the existing teaching learning practices of the semester system in this way:

Teaching methods are used according to the nature of the subject. For instance, I teach Projective Geometry and in this subject I myself have to be very active. I cannot leave everything only upon the students and thus the conventional method is more useful here. Likewise, I use the Flip Approach in teaching-learning process as a part of which I have created a facebook group and I send the study materials and notes of the topic to be taught tomorrow, today itself. This helps students to learn more easily.

Participant no.6 professor mentioned his views about the existing teaching learning practices of the semester system in this way:

Currently, we use IT for the teaching-learning. We encourage the students for group discussions on specific topics, presentations and project works involving various activities. We mostly use lecturer method and discussion method. We have also used student centered methods like discovery method,

presentation method, exhibition method, etc. find and rectify their doubts in a proper manner in tomorrow's class.

Participant no.7 previous student mentioned his views about the existing teaching learning practices of the semester system in this way:

In the annual system, mostly the teacher-centered method was used while in the semester system, student-centered method is extensively used. The students have been made more active in the teaching-learning process. Students were made to do presentations, group assignments, etc. and then evaluated based on their performances. The self-learning practice has also been developed in the students by allowing the students to explore more about the topics. However, some topics still require the use of lecturer-centered methods.

In FGD, 10 Students of M.Ed fourth semester present their opinions about the existing teaching learning practices of the semester system in this way:

Though we transitioned from the annual system to the semester system, there has been no significant change in the teaching-learning practices. Only some ICT methods have been used recently. Mostly, lecturer method and problem-solving method is used.

The above information shows that the teaching learning process of Central Department of Mathematics Education is quite good. Usually, department has expert excellence, consisting of Ph.D. degree holders and scholars. So, the teaching learning practice in the Central Department of Mathematics Education has been well and good. Mostly, ICT method, lecturer method, Flip Approach, discussion method, discovery method, presentation method, exhibition method, and problem-solving method is used. But, in recent times, students have been doing assignments,

project works, presentations, blogs, and using google for assignments. In such a manner, discussion method, project method, student centered methods are being used.

Challenges of Semester System in Mathematics Education

This section is related to the challenges of the semester system in the Central Department of Mathematics Education. I have mentioned the major challenges of the semester system in accordance with the collected information which are mentioned below:

Physical Challenges

Physical challenges include the challenges related with physical infrastructure. Physical infrastructure is the prerequisite of semester system. It indicates the college building, classroom and furniture, toilet, garden, play ground, library, laboratory, drinking water, administrative counseling desk, parking areas, first aid room, cafeteria, theater study centers, conference and meeting hall, auditorium, separate department, student welfare concerning room. It is the basic aspect of conducting semester system in which student and the teachers are practicing their work. In Central Department of Mathematics Education, I have found a lot of physical challenges. They have faced a lot challenges related with physical infrastructure. In the further process, I took interview with professors, lecturer, students and responses of them are listed below:

Participant no.1 lecturer mentioned his views about the physical challenges of the semester system in this way:

We have enough classrooms, benches, desks but we do not have wheeled chairs and so its not possible to conduct seminars immediately in the class, which a physical challenge. Classrooms are large enough to give comfortable

space to the students. We faced the shortage of electricity before but now we have solar system installed so we don't face it anymore. We have not been able to provide a well-facilitated library to the students where they can regularly sit and discuss the subject matters and search for books. The department does not have a large properly organized canteen, so the students are forced to adjust in the current small canteen. A larger canteen with proper tables and chairs would have helped students have their snacks, and at the same time discuss with their classmates to increase academic excellence. There is no practice of keeping daily newspapers in the library so the students can read them as per the need. There is also a lack of discussion rooms in the department. There should be individual discussion rooms where the students can approach the teachers personally to discuss and clear all their doubts. There are plenty of rooms in the department still individual discussion rooms have not been made available to the staffs. The staffs are forced to sit in a common room. There should be personal cabins being provided to every staff. These are some of the major physical challenges.

Participant no.2 professor mentioned his views about the physical challenges of the semester system in this way:

Students of the Masters Degree Program are mostly employed and cannot attend the classes regularly but without 80% of the attendance they cannot be allowed to sit for the exam. Also, if someone misses the internal exams due to medical or family problems, some professors allow them to take up the compensation exam while some do not.

Participant no.3 lecturer mentioned his views about the physical challenges of the semester system in this way:

There is a lack of infrastructure according to the semester. Also, during classes technical difficulties such as Wi-Fi problems or improper functioning of the projector have been observed to reduce the effectiveness of the classes. Irregular electricity supply also leads to the disruption of the class, but solar power has not been managed yet. Both the students and the teachers are not so technically qualified to solve technical problems and thus additional technical assistants are required. In addition, seating management of students and lack of educational materials for the students are some other physical challenges.

Participant no.4 professor mentioned his views about the physical challenges of the semester system in this way:

After the implementation of the semester system, student has to be at least 80% regular in the class. But the students are facing problems to meet such regularity. There are not enough classrooms to accommodate all students. The available resources too are not used by the students to the optimum level. The habit of bringing and reading books from the library and CRC has not yet developed in the students. There are many other similar physical challenges at present.

Participant no.5 lecturer mentioned his views about the physical challenges of the semester system in this way:

Semester system has made at least 80% attendance to be mandatory and this has caused problems for the job-holder students. Such students are now being deprived of the semester system.

Participant no.6 lecturer mentioned his views about the physical challenges of the semester system in this way:

Faults in the IT devices, improper functioning of Wi-Fi connection, classrooms with little facilities such as damaged windows, dusty classes, etc. The university has hired enough no of cleaners but their services has not yet reached the needy.

Participant no.7 previous student mentioned his views about the physical challenges of the semester system in this way:

Maybe because of our prior habit to study in such classrooms, I didn't find any major physical challenge. I believed that the university is fulfilled with plenty of infrastructures. Though the semester system was implied to maintain international standards, classrooms of such standards are not available. I have seen many youtube videos of Oxford University's Mathematics classes. In their classes, the students are made to sit in a circle and there are separate whiteboard, smartboard and graph boards. All theories are first taught experimentally and then theoretically. That is not the case with our university. We only have arrangements for whiteboard and projector. Addition of at least the graph boards would help improve effectiveness of the teaching learning process. Thus, while comparing with the international level we are still very far behind in infrastructure development and we need to bring a lot of improvements in that which stands as a major physical challenge.

In FGD, 10 Students of M.ed fourth semester present their opinions about the physical challenges of the semester system in this way:

When it comes to the physical facilities, the Central department faces difficulties in managing four semesters at the same time. Its difficult to

arrange seats for the students in a class. Also, for slideshows, the projecting screen is not provided in every class, instead the walls have been painted to serve as the projecting screen. As far as I am concerned, there has been no improvement in the physical facilities in the semester system as compared to the annual system.

The above information shows that the Central department of Mathematics Education faces difficulties in managing four semesters at the same time. Its difficult to arrange seats for the students in a class. Also, for slideshows, the projecting screen is not provided in every class, instead the walls have been painted to serve as the projecting screen. Also, there is faults in the IT devices, improper functioning of Wi-Fi connection, classrooms with little facilities such as damaged windows, dusty classes, etc. The department does not have a large properly organized canteen, so the students are forced to adjust in the current small canteen. A larger canteen with proper tables and chairs would have helped students have their snacks, and at the same time discuss with their classmates to increase academic excellence. There is no practice of keeping daily newspapers in the library so the students can read them as per the need. There is also a lack of discussion rooms in the department. There should be individual discussion rooms where the students can approach the teachers personally to discuss and clear all their doubts. There are plenty of rooms in the department still individual discussion rooms have not been made available to the staffs. The staffs are forced to sit in a common room. There should be personal cabins being provided to every staff. These are some of the major physical challenges. According to international standards, classrooms of such standards are not available. There are not separate whiteboard, smartboard and graph boards for students and teachers. All theories are taught

theoretically not experimentally but in international university all theories first taught experimentally and then theoretically.

Academic Challenges

Participant no.1 lecturer mentioned his views about the academic challenges of the semester system in this way:

The major academic challenge here is the gap between the teachers and the students. It is necessary to abolish that gap. Till date the teachers are more lecture-oriented and the students tend to be focused towards copying and pasting the teacher's notes. We have still not been able to develop the modality to increase classroom participation of the students, to find more engaging group activities, to share knowledge with classmates, etc. which is a major academic challenge. Still the students have the habit of studying only the topics from which questions are asked in the exams. We are also unable to prepare questions in order to test the creativity of the students. We have only been able to test the knowledge level of the students and so the students do not get a chance to show their creativity. There is less practice of open questions in the subject of mathematics which is an academic challenge. We have not been able to devise ways of extracting creativity of the students, set research-oriented open questions, to reduce their dependence on teacher's notes and make them use the internet and other resources to find answers and solutions and this surely is a major challenge for classroom teaching. Also, the unavailability of expert teachers for each subject is also a challenge for us. Some of the expert teachers are unable to establish their comfortability with the ICT while the new teachers are less experienced and are unable to engage the students much in the class. Our main academic challenge is the inability to

focus on the creativity and collaboration of the students. This challenge is the result of long-time practice of annual system where the teachers delivered lectures and students copied them and this practice is continuing. Our question paper has also not been able to help develop the creativity of the students. We have not been able to provide the environment for the students to visit the library to study more.

Participant no.2 lecturer mentioned her views about the academic challenges of the semester system in this way:

The students are updated on a daily basis. The course has also changed from the past. Students have access to internet and so the students are very well prepared before they go to the class and this requires the teachers also to be very active in the class. Similarly, the academic improvements of the teacher also holds many challenges. Currently, Ph.D. degree is required for the promotion of the teachers, for which they need to publish articles, do in-depth study, etc. Unfortunately, the teachers do not have personal rooms for their own study. There is a lack of environment for the research activities and then publishing articles. The department also needs to conduct Academic Interaction and Academic Workshop Programs on time.

Participant no.3 professor mentioned his views about the academic challenges of the semester system in this way:

Actually, semester system requires research based learning but such teaching learning process has not been achieved yet. Both the students and the teachers seem to be eager to finish the course as early as possible. Students also appear to enjoy the traditional methods of learning, they have very low

interests in going to the library and reading the books in depth. Time-to-time feedbacks are also lacking. In the currently running online classes, a single teacher is checking 40-50 copies and is unable to provide timely feedbacks and personal feedbacks to students. Thus, to eradicate such problems, the professors and Central Department of Mathematics themselves need to take a step forward.

Participant no.3 professor mentioned his views about the academic challenges of the semester system in this way:

There are plenty of academic challenges. The previous annual system itself has been totally converted to the current semester system. The semester system has not met its own basic principles. The annual system cannot just be totally reformed into the system, there are many other changes required. Such changes are supposed to be improved from the policy itself and the students also need to bring a change in their behavior. Otherwise, the students may develop the mentality that the teachers should teach less and then ask questions only from what has been taught. But, in this way, the basic aims of the semester system will never be fulfilled. Thus, to help students bring a change in their behavior, it is required that the reforms be introduced from the policy level itself. Since the semester system has been implemented, we should also formative assessment methods and not only the summative assessment methods. Each and every activity of the student should be evaluated; a portfolio should be made for every student and their portfolio assessment should be done. In our practice, the students only give written exams for both internal and external assessment, which is just not the basic principle of semester system. Student should receive timely feedbacks. They should also get

a chance to improve their grades. The practice of students studying less but the teachers giving them good grades in the internal exams needs to end. The students should be made maximum active in the class.

Participant no.4 professor mentioned his views about the academic challenges of the semester system in this way:

Semester system only has 48 credit hours, but the course content is exactly as that of the annual system and thus its very difficult to complete the course on time. Thus, no matter how fast the teacher completes the syllabus, it is always difficult for the students to prepare well for the exams.

Participant no.5 professor mentioned his views about the academic challenges of the semester system in this way:

There are plenty of students joining us who do not have meet the exact requirement of knowledge required for admission to the Master's Level. We ourselves get surprised by imagining how some student would have passed the Bachelor's level with such a low level of knowledge. Also, some teachers do not have the equivalent level of knowledge. Some of the teachers are well advanced while some are still learning. This subject should not be discussed much because the university must have thought of them as a qualified teacher before appointing them. Thus, as per me, both the students and teachers face academic challenges.

Participant no.6 lecturer mentioned his views about the academic challenges of the semester system in this way:

Till now, the method of teachers giving the notes, students copying them and memorizing them is continuing, which needs to be changed and converted into

an experimental method of learning. The use of lecture methods need to be reduced and the teaching learning process needs to be more and more student-centred. It seldom goes unnoticed that people say that Mathematics is a very difficult subject. Our mathematics professors go on speaking as much to make this behavioral but we, ourselves, have studied many large theorems but we do not know any of its practical uses. We have never been able to relate these theorems to any applications and it is a great academic challenge since our teachers have been unable to include daily life examples for such theorems

Participant no.7 Professor mentioned her views about the academic challenges of the semester system in this way:

As far the admission is concerned, in the first batch of semester system, there were 300 students accommodated in 6 sections. Next year, there were 5, then 4 currently only 2 sections are there with a total of 90 students. So, it is very important for all students, teachers, mathematicians to focus on how mathematics can be a subject related to real life.

Participant no.8 previous student mentioned his views about the academic challenges of the semester system in this way:

Being the first batch of the semester system, we didn't get the required books, so we made notes of each topic using google searches. It was difficult for us to get books based on our curriculum. I witnessed that the teachers did not have proper guidance. Since no proper training was given to the teachers regarding how to proceed with the semester system so they were themselves not very clear about it. Conducting delayed exams, unavailability of curriculum-based

books and experimental materials, thus limiting the students only to the theoretical knowledge, etc. are the academic challenges. Also, the politics entering the system has affected the academics. Activities like researching, learning, being a think-tanker, etc. are the academic challenges.

In FGD, 10 Students of M.Ed fourth semester present their opinions about the academic challenges of the semester system in this way:

To say for the academic challenges, I would take note of the statement of the Chief of public Service Commission, Mr. Tana Gautam, who stated that students of mathematics study theoretically and are not fit for teaching jobs, so students from other departments should be hired for the teaching jobs. Such a statement coming from one of the most reputed organization is a question on the level of university, which is surely an academic challenge. It has been seen that the semester system has only been a compulsion for the students, and people in the central department are discussing whether there will be at least one section in the next academic year. So, it is the duty of the administration to discover the reasons for the decrease in the number of students every year and help improve it. Though the semester system has been implemented, it has only changed the outer cover. Internal teaching-learning practices still remain the same and that according to me might be a reason for the reduction in number of students. Our Mathematics Department's major academic challenge is that in every semester we teach 4 mathematics subjects containing plenty of theorems, but we never explain what their uses are. So, when people say that studying mathematics till Class 12 is enough, why should we study in higher levels, the Masters' Level students have no clue what to answer. Thus, there is a need to make mathematics a much more practical

subject and hence a curriculum containing real-life applications of mathematics should be designed.

The above information shows that there are plenty of academic challenges. The semester system has not met its own basic principles. The annual system cannot just be totally reformed into the system, there are many other changes required. Such changes are supposed to be improved from the policy itself and the students also need to bring a change in their behavior. Otherwise, the students may develop the mentality that the teachers should teach less and then ask questions only from what has been taught. But, in this way, the basic aims of the semester system will never be fulfilled. The major academic challenge is that in every semester teacher teach 4 mathematics subjects containing plenty of theorems, but they never explain what their use are. So, it is very important for all students, teachers, mathematicians to focus on how mathematics can be a subject related to real life. Conducting delayed exams, unavailability of curriculum-based books, lengthy course content, experimental materials, gaps between the teacher and students, copying and pasting the teachers notes, less practice of open question in mathematics classroom, inability to focus on the creativity and collaboration of the students and limiting the students only to the theoretical knowledge, etc. are the academic challenges.

Technological Challenges

Participant no.1 lecturer mentioned his views about the technological challenges of the semester system in this way:

For the learning the use of technology, each teacher and student needs to have access to laptops, smartphones, internet, etc. but the problem lies in the fact that we have students coming from various corners of the country and due to their financial conditions they are unable to possess electronic devices, so it

should be the responsibility of the department to arrange ICT facilitated classrooms but that's not been the case. We do have free Wi-Fi available, but we need a free Wi-Fi zone where all the students can use Wi-Fi to access the internet. Until now, in the ICT lab 2-3 students are forced to use the same laptop. If we had been able to make our students technology-friendly, then we could teach them 10-day long topics in 2 days. We could have just given them the basic concepts and then asked them to explore and learn more on their own. Also, all the teachers do possess a laptop because every department has provided one laptop each to their teachers. But not all the students have a laptop so even if the teachers provide study materials on an online platform, the students are unable to access them. These are all the technological challenges faced.

Participant no.2 Professor mentioned his views about the technological challenges of the semester system in this way:

The technological challenges are faced by both the teachers and the students. Many students cannot afford to have a laptop and also do not have access to internet facilities. Also, the backup for irregular power cuts are also not available.

Participant no.3 Professor mentioned his views about the technological challenges of the semester system in this way:

Little knowledge about technology to the teachers, inability to use newer technological devices and lack of timely trainings to introduce the teachers to the technology are some of the major technological challenges. There is a proper lack of technical assistant to respond and solve technological problems

during the teaching learning process. Students coming to the university from the extreme parts of the country face the problem of not having electronic devices such as mobiles, laptops, etc and not even being able to afford it and hence are unable to use web services for learning purpose.

Participant no.4 Professor mentioned her views about the technological challenges of the semester system in this way:

Many students do not have access to technological devices. Also, there is less and unidentified usage and reach of internet connection. The learned students too do not show much interest in using the internet and technology to the maximum benefit in their education. Instead they use it for entertainment purposes.

Participant no.5 Previous student mentioned his views about the technological challenges of the semester system in this way:

There are large technological challenges present. Due to the current pandemic, such challenges have become more evident. Unavailability of access to technology for both the students and the teachers is a major issue. Neither the students nor the teachers are technology friendly. This requires regular trainings for the teachers to help them learn about the technological advancements and their uses and the applications of various softwares in the teaching-learning process. There is currently a lack of ICT skills in the department and this is a major technological challenge. During the current pandemic, we conducted classes using various online modes, but it wasn't possible in many places. It was only possible in the towns/cities and not in

remote rural areas. Thus, I believe there are major technological challenges present.

In FGD,10 Students of M.Ed fourth semester present their opinions about the technological challenges of the semester system in this way:

Plenty of technological challenges have been resurfaced by the COVID-19 pandemic. There was no plan of conducting online classes in our university, while in other universities, online classes were conducted, exams were taken in the online mode and students have already begun passing out. But we faced all sorts of difficulties during the lockdown. Some teaching practices were done during the period of lockdown but till now there is no sign of when the final exams will be conducted. Its not at all clear to us as to why other universities can conduct valid online exams and publish results but T.U. cannot do so. The computers in our ICT present another technological challenge for us. They have been used merely for taking pictures of the ICT lab. We are only able to use the lab if we take our own laptop there. We admit students saying that we study ICT in Mathematics, but we ourselves do not even have proper access to internet. To download any online study material, we have to go to our own houses and get it done. These are the sorts of technological challenge present for us.

The above view shows that there are large technological challenges present.unavailability of access to technology for both the students and the teachers,unavailability access to laptop, smartphone etc,unavailability ICT faciliated classroom,unavailability free WI-FI zone,inability to use newer technological

devices, lack of timely training, lack of technical assistant and lack of ICT skills in the department etc are technological challenges.

Administrative challenges

Participant no.1 lecturer mentioned his views about the administrative challenges of the semester system in this way: :

Administration has not been able to digitalize their activities and this forces students to stand in long queues even for mediocre works and also to go here and there for a particular reference study materials, certificates and papers published since they have not been provided online by the administration. The administrative staffs are not ICT friendly, they have not been able to monitor the classes and keep record of regularity and proper functioning of the class. This has led to courses not finishing on time, less understanding of topics taught by the students, and more such problems and due to almost no suggestions provided by the administration, the teachers have not been able to work on their teaching techniques. Thus, in this way, the lack of timely monitoring of the teachers and students has been an administrative challenge. The administration should keep note of every activity of the students, like knowing all the students, regularity of the students, interaction of the students in the class, understanding of the class by the students, exploration of the reasons for not understanding the class by the students, etc. These are some of the major challenges faced by the administration.

Participant no.2 lecturer mentioned his views about the administrative challenges of the semester system in this way:

Administrative challenges are quite visible in the Tribhuvan University. There is a lack of expert manpower in the admin department. The students have to

face difficulties for mediocre things. So the administrative works should be made online.

Participant no.3 lecturer mentioned her views about the administrative challenges of the semester system in this way:

The absence of timely interaction between the teachers and the administration has caused many administrative problems.

Participant no.4 professor mentioned his views about the administrative challenges of the semester system in this way:

There a lot of administrative challenges too. In the present 21st century, the administrative services are expected to be carried on manually but it is not done so. Likewise, the administration is also not able to offer quick responses, thus affecting the smooth functioning of the activities.

Participant no.5 professor mentioned his views about the administrative challenges of the semester system in this way:

In the annual system, exams were conducted only once a year but in the semester system, exams are conducted twice a year (every 6 months) and this has increased the load on the administration. The administrative office faces a lot of challenges to ensure on-time registration of students, exam form fill-up by the students, submission of internal and practical marks, and conducting Viva-Voce.

Participant no.6 professor mentioned her views about the administrative challenges of the semester system in this way:

We lack expert staffs in the department. In such a large department as ours, we require talented technical staffs but the administration has not provided

them to us. In the countries abroad, there are less students in the class and teachers themselves keep record of every student. But with us the case is totally different. We have too many students in a single class and we lack proper staffs to keep record of every student.

Participant no.7 previous student mentioned her views about the administrative challenges of the semester system in this way:

In today's digital world too, the students are required to collect their admit cards physically just before a day prior to the exam. Many students have to come from far away places just before a day to the exam and then stand in the line for 1 to ½ hours and then finally get their admit cards. This is for sure an administrative challenge. Instead of this, the administration should provide admit cards to the students in their mails so they can print it whenever they want and they do not have to face any problems as mentioned before. Students are required to fill the form for exams every semester and then go to the Nepal Bank Ltd. far from the department to deposit the exam fees and also if the admission slip is lost then again they need to go to the Nepal Bank Ltd. just to pay Rs. 10. This too is also an administrative challenge. Till now, students are forced to wait for 1-2 months before they receive their ID cards. Also, due to the presence of auditorium hall in the Education Department, the ongoing classes get disturbed by the noises due to the programs conducted in the auditorium hall. This too is an administrative challenge and it can be solved by ensuring that the hall is used only on holidays.

In FGD, 10 Students of M.Ed fourth semester present their opinions about the administrative challenges of the semester system in this way:

There has been specific plan of action devised for the proper functioning of the semester system. Sometimes the exams are conducted without any prior information, while some other time scheduled exams also get postponed due to the protests by few students. This shows that there is a lack of an administration which can take bold decisions and ensure proper functioning of the semester system. According to me, the university should have a proper academic calendar and the dates of admissions, exams and other activities should be fixed. Also, the university should have a proper internet connection accessible to all the students. During the admission process, the students have to go to Nepal Bank Ltd. to get a voucher of Rs. 10/- and then come back again to the administration office which might get closed by the time he/she returns. This should be checked upon and necessary measures must be taken to comfort the students. After the implementation of the semester system, the need for a separate discussion room has arisen, for the students to sit together and discuss the matters of interests. Also, a modern library and a mathematical lab should be setup in the department.

The above information shows that the administrative office faces a lot of challenges to ensure on-time registration of students, exam form fill-up by the students, submission of internal and practical marks, and conducting Viva-Voce. Inability to digitize administrative activities, lack of timing and monitoring of teachers and students, lack of ICT knowledge in administrative staffs, lack of expert manpower in the administration department, lack of timing interaction between teacher and administration are major technological challenges.

Opportunity of Semester System in Mathematics Education

This section is related to the opportunity of the semester system in the Central Department of Mathematics Education. There are a lot of opportunities in the semester system. The challenges are only faced in the implementation of the system. A student develops as an autonomous learner in this system. Also, the grading system used in the results matches with the international standards and thus helps in going for abroad studies. This system has also reduced the student-teacher gap and improved the quality of their relations. So, the teacher knows how abled the student is and the students know how good a teacher is. This kind of a direct connection between the students and teachers assists effective learning. I have mentioned the major opportunity of the semester system in accordance with the collected information which are mentioned below:

Physical Opportunity

Participant no.1 professor mentioned his views about the physical opportunity of the semester system in this way:

When the student performs well, they receive scholarships from the Department as well as the UGC. Also, the students can go abroad for Ph.D. after completing their mathematics education

Participant no.2 professor mentioned his views about of the physical opportunity semester system in this way:

After the implementation of semester system, a Higher Education Project was undertaken which helped develop the infrastructure. Similarly, Norway Project, in addition to development of infrastructure, also made the ICT lab and physically supported the department. The Higher Education Project

provided laptops and training to the teachers. Likewise, the Norway Project enhanced the ICT lab also focused on enhancing the teachers by providing maximum skill based training

Participant no.3 professor mentioned his views about the physical opportunity of the semester system in this way:

After the implementation of semester system, a Higher Education Project was undertaken which helped develop the infrastructure. Similarly, Norway Project, in addition to development of infrastructure, also made the ICT lab and physically supported the department. The Higher Education Project provided laptops and training to the teachers. Likewise, the Norway Project enhanced the ICT lab also focused on enhancing the teachers by providing maximum skill based training. The students have the classroom as major physical facility, library as the resource center, and Wi-Fi connection for their immediate learning needs.

Participant no.4 professor mentioned his views about the physical opportunity of the semester system in this way:

All I can say is that there is a library for the students to get the materials they need. There is a large ground where students can meet and discuss their knowledge. There have many improvements now as compared to before. We now have larger classrooms and we can easily conduct viva exams

Participant no.7 previous student mentioned her views about the administrative challenges of the semester system in this way:

We have heard that during the annual system when there used to be 1200-1300 students in a single class, the students even used to attend classes while

on the windows and doors. But during the semester system, the students were divided into various sections with 50 students each and this arrangement itself is a physical opportunity for the students and the teachers as this increased the effectiveness and understanding of the class for the teachers as well as the students. We were able to carefully listen to everything the teacher said in the class and do group activities

The above information shows that there is a lot of physical opportunity. There is a library for the students to get the materials they need. There is a large ground where students can meet and discuss their knowledge. The students have the classroom as major physical facility, library as the resource center, and Wi-Fi connection for their immediate learning needs. There is a well-facilitated ICT lab.

Academic Achievement

Participant no.1 professor mentioned his views about the academic achievement of the semester system in this way:

Masters Degree in Mathematics Education is in itself an academic achievement. Only the content knowledge will be not be sufficient now.

Content Knowledge, Pedagogy, and Technology are now required to be used together, because if one only has the knowledge of content and pedagogy but no technology, such an education will be considered disabled. Also, if one knows technology, but lacks confidence in communication, power, content delivery, then the education will be effective at all. Similarly, if the teacher knows pedagogy but lacks technology and content, the education will be disrupted for sure. Thus, the cumulative use of the content, pedagogy and

technology will help prepare a competitive set of mathematicians.

Scholarships help encourage the students towards learning.

Participant no.2 lecturer mentioned his views about the academic achievement of the semester system in this way:

Semester system has reduced the drop-out rate of the students. Students have become more regular and engaging than in the yearly system. Hence the students are able to score more marks and the success rate of students has increased.

Participant no.4 professor mentioned his views about the academic achievement of the semester system in this way:

Academic achievement has been good. Many students have passed the Teacher's Service Commission exams and many other exams.

Participant no.5 lecturer mentioned his views about the academic achievement of the semester system in this way:

Actually, the university is supposed to collaborate with inter-cultural university. We have students from different backgrounds under the same roof and there is a good chance for us to share knowledge with each other. But the department has not conducted the Intra-Department Culture Sharing Program and I believe that should be conducted. We should also conduct cultural exchange programs with students from other institutions, but it has not been done. We have witnessed that students passing from our department mostly crack public service exams and especially the teacher's service commission exams. Also, we have many of our students as Statistics Officers. This means that the manpower we are creating is in demand in the market and are getting

high profile jobs. 10 years from now, I see a lack of mathematics teacher in the education industry. Our students also have the opportunity of creating a research-based academic career. Moreover, all the opportunities depend upon the individual interest and hardwork of the students. To sum it up, though its been 5-6 years since the implementation of semester system, we are still in the beginning of it. Though we have realized some of the objectives and norms of the semester system now, we are still facing problems. Sometimes we have to go through a real struggle to manage books and copies even though being in such an appreciated national university. We are using the lecturer- oriented method, but I believe the collaborative method will be more helpful to us in proceeding towards the excellence.

In FGD,10 Students of M.Ed.fourth semester present their opinions about the academic achievement of the semester system in this way:

As a part of academic achievement, we have had the chances of learning from university toppers and well-experienced and talented teachers. If the students wish, they can gain tremendous knowledge from these teacher.

The above information shows that there is a lot of academic achievement. Students are able to score more marks and the success rate of students has increased. Many students have passed the Teacher's Service Commission exams, Public service exam, statistics officer and many other exams.” Students have had the chances of learning from university toppers and well-experienced and talented teachers. If the students wish, they can gain tremendous knowledge from these teacher.

Technological opportunity

Participant no.1 lecturer mentioned his views about the technological opportunity of the semester system in this way:

Students can study ICT in Mathematics Education as an elective. They have proximity with technology after reaching C:D M.E. They have to prepare slides for presentations. There is excellent learning environment. Students have access to technologies; they are well involved in their activities. That's good.

Participant no.2 lecturer mentioned his views about the technological opportunity of the semester system in this way:

During the COVID pandemic, the department has grown strongly and has been able to conduct online classes, online exams, give and take assignments, conduct classes based on Moodle, etc. which is a major technological opportunity. Also, the department has made a studio where teachers can do video conferencing and video recording. Due to this, the teachers now have the opportunity to record and send learning videos to the students. Now, we have a modern seminar room containing better cameras, audio system, advanced screen so we can record and stream videos on youtube where students can easily access them. We also have a separate course called ICT in Mathematics which helps students get familiar with mathematical softwares like Geogebra, Mathematica, Latex and also learn basic computer applications. The students can learn to use them currently as students and later utilize them in the future as tutors.

Participant no.3 previous students mentioned her views about the technological opportunity of the semester system in this way:

At the beginning, we used to go to the cybers to get things typed and printed since we didn't have the required electronic devices. We also submitted some hand-written assignments but gradually we learnt typing, printing, making presentations, submitting assignments through blogs, etc. as a part of our technological opportunity.

In FGD,10 Students of M.Ed. fourth semester present their opinions about the technological opportunity of the semester system in this way:

Here, we have the chance to teach a subject named ICT in Mathematics Education as a technological opportunity. We have been able to teach mathematics in Visualise Method, instead of only the Solving Method, by using various and advanced softwares. In this process, we have had chances to learn different mathematical softwares like Geogebra, Mathematica, Matlab, Mapple, etc.

The above information shows that there is chance to study ICT in Mathematics Education as a technological opportunity. Students have been able to study mathematics in Visualise Method, instead of only the Solving Method, by using various and advanced softwares. In this process, they have had chances to learn different mathematical softwares like Geogebra, Mathematica, Matlab, Mapple, Latex and also learn basic computer applications etc. There is a studio where teachers can do video conferencing and video recording. Due to this, the teachers now have the opportunity to record and send learning videos to the students. Now, there is a modern

seminar room containing better cameras, audio system, advanced screen so teachers can record and stream videos on youtube where students can easily access them.

Academic Writing opportunity

Participant no.1 lecturer mentioned his views about the academic Writing Practices of the semester system in this way:

As a part of academic writing in the 4th semester, we ask the students to write thesis, book reviews, long essays, literature reviews, seminars, etc. as per our course instructions. We also make the students write on indigenous knowledge and gender inequality, gender issues, etc. which is itself included in the course. These topics are included in the Studies in Mathematics subject. In the final semester, as a part of academic writing, we have Thesis Writing where we teach the students to write proposals, give training for proposal writing, conduct orientation for briefing about thesis writing and provide separate supervisors to the students who monitor and help the students to write accurately. We also motivate the students about the scholarships provided by the UGC and also to write articles. Some students only show interest in writing the thesis but some students who also show their interests in writing articles, we provide them that opportunity too. Recently, I myself helped publish one of the student's article while another student's article is about to be published. These articles will prove to be milestones for the students in their academic career. These are all the academic opportunities. The department is supposed to be publishing the journal by selecting the articles from the students themselves, but we have not been able to do that. However, we are planning to do it in the near future. We are planning that students,

teachers and supervisors can write the articles and then review and publish some of those articles in coordination with each other.

Participant no.2 professor mentioned his views about the academic Writing Practices of the semester system in this way:

To improve academic writings, there is a separate course in the syllabus and upon studying the course attentively, the students can excel in this field too.

Participant no.3 professor mentioned his views about the academic Writing Practices of the semester system in this way:

- *Chance for critical analysis*
- *Development of the ability to write seminars*
- *Ability to write thesis*
- *Ability to review*
- *Excellence in Academic Writing*

Participant no.4 lecturer mentioned his views about the academic achievement of the semester system in this way:

Due to the semester system, students were able to understand and study the research subject. Due to regular seminar writings, book reviews, literature reviews, research writings, the students developed as researchers. Some of my classmates are presenting papers in conferences and writing research. Thus, the students have received a golden opportunity to academically develop themselves as researchers.

In FGD, 10 Students of M.Ed. fourth semester present their opinions about the academic writing process of the semester system in this way:

As a part of academic practice, here we engage students in Book Review, Writing, Seminar Paper, Literature Review, Proposal and Thesis.

The above information shows that there is a great opportunity for academic writing practices. Students have opportunity to Book Review, Writing, Seminar Paper, Literature Review, Proposal and Thesis. They have opportunity to write on indigenous knowledge and gender inequality, gender issues, etc. Teachers teach the students to write proposals, give training for proposal writing, conduct orientation for briefing about thesis writing and provide separate supervisors to the students who monitor and help the students to write accurately. Teachers also motivate the students about the scholarships provided by the UGC and also to write articles. Students have chance for critical analysis and being excellence researcher.

Process of making Semester system students friendly

Participant no.1 lecturer mentioned his views about the Process of making Semester system students friendly in this way:

The Course content should be made in accordance with the semester system. I do not feel that the basic principle of semester system is currently followed. I believe that the teacher should have the authority to decide the nature of course, method of teaching, methods of assessments, but it has not been provided to the teachers. Likewise, we should also try to look upon the types of semester system implemented in other countries for improvements. The subject that I teach is my course, I hold the future of my students and I should have the right to expertise them in my course content and I should be able to develop

the ability to be responsible for that. Currently, many activities are being carried out blindly. Instead of realizing how much knowledge is required for the student, we are forced to finish a 48 credit hours course in the given fixed time. Some topics which are not at all required for the student have also been included in the course content. Thus, I believe that the teacher should have the power to decide the course content and teaching methods and this will improve the essence of the semester system. At the moment, the Dean Office has designed the curriculum which is being used throughout the country and I do not like this notion. I do not feel the same course would be applicable to both the students of Kirtipur and those of Jumla. Thus, I strongly suggest that mathematical course content should be region-specific.

Participant no.2 lecturer mentioned his views about the Process of making Semester system students friendly in this way:

Actually, the university is supposed to collaborate with inter-cultural university. We have students from different backgrounds under the same roof and there is a good chance for us to share knowledge with each other. But the department has not conducted the Intra-Department Culture Sharing Program and I believe that should be conducted. We should also conduct cultural exchange programs with students from other institutions, but it has not been done. We have witnessed that students passing from our department mostly crack public service exams and especially the teacher's service commission exams. Also, we have many of our students as Statistics Officers. This means that the manpower we are creating is in demand in the market and are getting high profile jobs. 10 years from now, I see a lack of mathematics teacher in the education industry. Our students also have the opportunity of creating a

research-based academic career. Moreover, all the opportunities depend upon the individual interest and hardwork of the students. To sum it up, though its been 5-6 years since the implementation of semester system, we are still in the beginning of it. Though we have realized some of the objectives and norms of the semester system now, we are still facing problems. Sometimes we have to go through a real struggle to manage books and copies even though being in such an appreciated national university. We are using the lecturer-oriented method, but I believe the collaborative method will be more helpful to us in proceeding towards the excellence in the field of mathematics education.

Participant no.3 professor mentioned his views about the Process of making Semester system students friendly in this way:

The curriculum should be reformed such that the course content meets the requirement of the semester system as well as remains market-oriented. A course compatible with the 21st century and job-oriented course will help build useful manpower in the industry.

Participant no.4 lecturer mentioned his views about the Process of making Semester system students friendly in this way:

Due to poor English, students do not perform extremely well in academic writing. However, they have been performing quite satisfactorily. Post Modernism Philosophy should be used in the teaching-learning process because TU invites students from all over the country with different mindsets. So they cannot be treated same, and requires the use of Multiple Realities. Instead of thinking that teacher is the bank of knowledge, the teacher should be considered as their collaborator and mentor. The student needs to grab the

most out of the teachers. Students should be given their fundamental respect and the knowledge should be simplified to make the semester system friendlier

Participant no.5 lecturer mentioned his views about the Process of making Semester system students friendly in this way

As per the norms of the semester system, using student-centred teaching methods, human resource management, use of inductive method in the teaching-learning process, focus on group works and steam works, improving the efficiency of internal evaluation, equivalent no of teachers based on the student-teacher ratio, timely motivations, encouragement trainings and increased services for teachers, etc. can be implemented.

Participant no 6 previous students mentioned his views about the Process of making Semester system students friendly in this way:

TU should collaborate with donor organizations to provide laptops to poor students which should be totally fair and not political. I feel that the system could be more effective if digital classes are conducted with the help of digital tools. If the topics to be taught in the next class are provided digitally to the students prior to the class, the students can prepare well before they go to the class. There is a need to digitalize the administrative activities and also a digitalcircle should be created between the teachers and the students where they can share what they have learnt and clear their doubts.

In FGD,10 Students of M.Ed. fourth semester present their opinions about the Process of making Semester system students friendly of the semester system in this way:

To make semester system friendly, we need to focus more and more on its proper implementation. Instead of taking only the Paper-Pen Tests, there should be performance-based assessments. Much more importance should be given to practical knowledge than theoretical knowledge, for example, while explaining a topic instead of only making them write the theory, we should also explain their practical applications. Also, rather than only asking the students to write about what a seminar is, what its components are, how its written, we should make them write actual seminar papers, allow them to present their papers in a conference. This way we can focus more on practical knowledge.

The above information shows that As per the norms of the semester system, using student-centred teaching methods, human resource management, use of inductive method in the teaching-learning process, focus on group works and steam works, improving the efficiency of internal evaluation, equivalent no of teachers based on the student-teacher ratio, timely motivations, encouragement trainings and increased services for teachers, etc. can make semester sytem students friendly. The curriculum should be reformed such that the course content meets the requirement of the semester system as well as remains market-oriented. A course compatible with the 21st century and job-oriented course will help build useful manpower in the industry. To make semester system friendly, we need to focus more and more on its proper implementation, performance-based assessments, practical knowledge than theoretical knowledge, practical applications, writing actual seminar papers and allow students to present their papers in a conference. This way we can make semester system students friendly.

Chapter V

Findings, conclusion and Implication

This chapter deals with the finding, conclusion and implication. The first section reveals the major findings of the study, conclusions are derived on the basis of research analysis in the second section and finally, implication of this research study are highlighted at the end.

Findings

Findings are the reality of the field in which I have found by his/her data collection process. The findings reflect the actual position of the semester system in the Central Department Of Mathematics Education along with its challenges and opportunity.

The findings of this research are divided into three major aspects according to the objectives. I have mentioned such findings in this way:

Major Findings Related to the Practices of Semester System

The practice of the semester system is quite different from the annual system in its techniques.

- It was necessary for students to qualify the entrance exam for admission in the Central Department of Mathematics Education.
- Country-wise entrance exam is conducted by the Dean office by setting a specific criteria.
- In entrance exam, students have to secure 50% marks for crack the entrance exam.
- The number students enrolling semester system has decreased.
- 80% attendance is mandatory.

- Students' enrollment is quite less rather than the annual system.
- There is the practice of internal evaluation in the semester system which is conducted by the teachers for 40 marks, out of the 100 marks with specific criteria.
- the internal 40 marks are divided as 5 marks for active participation, 5 marks for attendance, 10 marks for first term exam, 10 marks for 2nd assignment and 10 marks for the final internal written exam.
- There is the practice of internal evaluation system in the semester system which is more helpful for the students for their final examination or the achievement.
- There is the practice of external evaluation in the semester system which is conducted by the Dean Office for 60 marks, out of the 100 marks.
- The external evaluation consists of 10 objective questions for 1 mark each and for the remaining 50 marks, 2 long questions of 10 marks each and 6 short questions for 5 marks each.
- The setting of the question paper, conduction and management of exam and publishing the results is done by the Dean Office itself.
- If there is a difference of greater than 20% in the internal and external marks, then the aggregate score of the student gets reduced and is done automatically by the software.
- There is more use of the student centered methods than the teacher centered methods to deliver the content in the classroom.
- Mostly, ICT method, lecturer method, Flip Approach, discussion method, discovery method, presentation method, exhibition method, and problem-solving method is used.

- There is general practice of the use of technology as a medium, basically computer and the projector are used to deliver the content.

Findings Related to the Challenges of the Semester System

- Conducting delayed exams.
- Declaring untimely exam result.
- Calender not followed strictly.
- The course content is exactly as that of the annual system and thus its very difficult to complete the course on time.
- Always difficult for the students to prepare well for the exams.
- Unavailability of curriculum-based books and experimental materials.
- The gap between the teachers and the students.
- Students, copying and pesting the teachers notes.
- Students have the habit of studying only the topics from which questions are asked in the exams.
- There is less practice of open question in mathematics classroom.
- Inability to focus on the creativity and colaboration of the students and limiting the students only to the theoretical knowledge.
- Increased the load on the administration.
- The administrative office faces a lot of challenges to ensure on-time registration of students, exam form fill-up by the students, submission of internal and practical marks, and conducting Viva-Voce.
- There are various lacks of administrative staffs towards the student's facilitation in terms of their assignment, enrollment, registration, examination and other circumstances.

- There is unavailability of access to technology for both the students and the teachers.
- Inability to use newer technological devices and lack of timely trainings to introduce the teachers to the technology.
- There is a proper lack of technical assistant to respond and solve technological problems during the teaching learning process.
- All students donot have access to laptop, smartphone etc
- Limiting the students only to the theoretical knowledge
- Llaking of technological device,timely training,technical assistant and ict skills.
- Inability to digitlize administrative activities.
- Llacking of timing and monitoring of teachers and students.
- Lack of expert manpower in the administration department.
- Lacking of coordination between the teachers, question setter, students, examiner and the experts.
- There is a problem of implementation of operation calendar formation by the Dean's office.
- There is difficult to slideshows, the projecting screen is not provided in every class, instead the walls have been painted to serve as the projecting screen.
- There is faults in the IT devices, improper functioning of Wi-Fi connection.
- There is also a lack of discussion rooms in the department.
- lack proper staffs to keep record of every student.

- There is not personal cabins being provided to every staff.
- There are not separate whiteboard, smartboard and graph boards for students and teachers.
- There are some gaps between subject teacher and students to deliver the content .
- Teachers never explain the useand application of theorem.
- Lacking of time to time and personnal feedback.

Findings Related Opportunity of Semester System

- opportunity of creating a research-based academic career.
- Opportunity to write and publish articles.
- There is central library containing worldwide journals .
- Opportunity to get high profile jobs.
- Many students have passed the Teacher's Service Commission exams, Public service Commission exam ,statistics officer and many other exams.
- Opportunity to gain knowledge from expert excellence, consisting of Ph.D. degree holders and scholars.
- There is a well-facilated ICT lab.
- Also provided access to e-library
- Students are able to score more marks and the success rate of students has increased.
- During the COVID pandemic, the department has grown strongly and has been able to conduct online classes, online exams, give and take assignments, conduct classes based on Moodle, etc. which a major technological opportunity

- Students have had the chances of learning from university toppers and well-experienced and talented teachers where they can gain tremendous knowledge from these teacher.
- There is chance to study ICT in Mathematics Education as a technological opportunity.
- Students have been able to study mathematics in Visualise Method, by using various and advanced softwares.
- They have had chances to learn different mathematical softwares like Geogebra, Mathematica, Matlab, Mapple, Latex and also learn basic computer applications etc.
- There is a studio where teachers can do video conferencing and video recording.
- The teachers now have the opportunity to record and send learning videos to the students.
- Students have opportunity to Book Review, Writing, Seminar Paper, Literature Review, Proposal and Thesis.
- They have opportunity to write on indigenous knowledge and gender inequality, gender issues, etc.
- They have opportunity to write proposals, literature review longessay and article etc.
- Students have opportunity to getscholarships provided by the UGC .
- Students have chance for critical analysis and being excellence researcher.
- Regular classrooms, authentic assignment submissions, close connection with teachers
- Expertise in ICT can be achieved with the help of ICT Lab.
- There is a library for the students to get the materials they need.

- There is a large ground where students can meet and discuss their knowledge.
- The students have the classroom as major physical facility and Wi-Fi connection for their immediate learning needs.
- Student have opportunity to receive timely feedbacks.
- Regular classrooms, authentic assignment submissions, close connection with teachers
- Expertise in ICT can be achieved with the help of ICT Lab

Findings Related Process of making Semester System Students Friendly

- The teacher should have the authority to decide the nature of course, method of teaching, methods of assessments.
- Only qualified students should be admitted.
- Using student-centred teaching methods
- Course content should be made in accordance with the semester system
- Mathematical course content should be region-specific.
- The curriculum should be reformed such that the course content meets the requirement of the semester system as well as remains market-oriented.
- The department needs to conduct Academic Interaction and Academic Workshop Programs on time.
- Need to bring infrastructure according with international level.
- Need to focus on performance-based assessments.
- Need to focus practical knowledge than theoretical knowledge and practical applications of Mathematics Theorems.
- Need to focus on writing actual seminar papers and allow students to present their papers in a conference.

- Need to make portfolio of each student.
- Need to focus on free Wi-Fi zone.
- Focus on group works steam works and collaboration.
- Improving the efficiency of internal evaluation.
- conduct cultural exchange programs with students from other Departments.
- Need to digitalize administrativeactivities.
- Need to develop the modality to increase classroom participation of the students, to find more engaging group activities, to share knowledge with classmates, etc.
- Need to create digital circle between the teachers and the students where they can share what they have learnt and clear their doubts.
- A course compatible with the 21st century and job-oriented course will help build useful manpower in the industry

Conclusions

The semester system in the Central Department of Mathematics Education is a newly introduced program in the academic year of 2071/2072. It has a short history but long importance. Semester system in the context of Nepal had been launched in the Panchayat system at firstlaunched but it was terminated in 2036 BS . After restoration of democracy it was re-launched in the TU in the academic year of 2071/2072.It has new practices according to its norms and standards.There is fixed student and teacher ratio in the University. Maximum 50 students equals to one teacher in a single classroom now a days.There is provision of internal evaluation (40%) and external evaluation (60%). Scoring is based on GPA (Grade Point Scale). The total course is divided into 3 credit-hours.Use of technology in the classroom is a new practice to deliver the content. Teacher and administrative staffs are responsible

in their duty along with students. Project work, presentation, home assignment, viva, immediate feedback and student centered teaching style are some innovative practices in the semester system.

There are some challenges and opportunity in the semester system. Some challenges of semester system are conducting delayed exams, declaring untimely exam result, calendar not followed strictly, lengthy course content, unavailability of curriculum-based books, inability to focus on the creativity and collaboration of the students and limiting the students only to the theoretical knowledge, lack of administrative staffs towards the student's facilitation in terms of their assignment, enrollment, registration, examination and other circumstances. Inability to use newer technological devices and lack of timely trainings to introduce the teachers to the technology, all students do not have access to laptop, smartphone etc, inability to digitize administrative activities, lacking of coordination between the teachers, question setter, students, examiner and the experts, lacking of time to time and personal feedback, decreasing student's enrollment, lack of administrative support, lack of monitoring and supervision, poor access to information and communication technology are some challenges of the semester system. Also, there is a lot of opportunity in the Semester System. Some opportunity of semester system are opportunity of creating a research-based academic career, opportunity to write and publish articles, opportunity to get high profile jobs, many students have passed the Teacher's Service Commission exams, Public service Commission exam, statistics officer and many other exams, there is central library containing worldwide journals, opportunity to gain knowledge from expert excellence, consisting of Ph.D. degree holders and scholars, there is a well-facilitated ICT lab, also provided access to e-library, students are able to score more marks and the success rate of students has

increased, chances to learn different mathematical softwares like Geogebra, Mathematica, Matlab, Maple, Latex and also learn basic computer applications etc, opportunity to Book Review, Writing, Seminar Paper, Literature Review, Proposal and Thesis, video conferencing room, active participation of teachers and students, seminar halls, opportunity to get scholarship provided by UGC, chance for critical analysis and being excellence researcher .

To make semester system students friendly the teacher should have the authority to decide the nature of course, method of teaching, methods of assessments, only qualified students should be admitted, using student-centred teaching methods, course content should be made in accordance with the semester system, mathematical course content should be region-specific, the curriculum should be reformed such that the course content meets the requirement of the semester system as well as remains market-oriented, the department needs to conduct Academic Interaction and Academic Workshop Programs on time, need to focus on performance-based assessments, need to focus practical knowledge than theoretical knowledge and practical applications of Mathematics Theorems, need to make portfolio of each student, need to digitalize administrative activities, need to develop the modality to increase classroom participation of the students, to find more engaging group activities, to share knowledge with classmates, use of technology is to be in the access of all the teachers, administrative staffs and students as well. Using student-centred teaching methods, use of inductive method in the teaching-learning process, focus on group works steam works and collaboration, improving the efficiency of internal evaluation, timely motivations, encouragement trainings and increased services for teachers, a course compatible with the 21st century and job-oriented , need to focus more and more on its proper implementation, , need to focus on writing actual seminar

papers and allow students to present their papers in a conference can make semester system students friendly.

Implications

This research is based on qualitative design which provided the deeper understanding of the “Implementation of Semester System in Mathematics Education: Challenges and Opportunity.” The result of this research which were drawn from deep and systematic analysis and interpretation of the collected data have very strong educational implications. The result obtained from this research is the matter of consideration for teachers, students, staff-members, educationist, mathematics educators, university administration, curriculum developer and other policy makers. To improve semester system and reduce the major challenges of this system, some implications are appropriate in this situation. The implication of this research are given below:

- The result of this research provide precious knowledge about semester system
- The result of this research is useful for teachers, students, parents, staff members, affiliated institutions of TU, and TU family to be familiar with semester system and know everything about semester system.
- This reserch support to analyze the major challenges and opportunities of semester system .
- The result of this researchhelp to modify the policies and practices of the university and its constituents as well as affiliated collages.
- This Researchhelp to promote student enrollment in university.
- This researchhelp to learn about challenges but also helps to know opportunity of semester system.

- As a new system, students and teachers feels difficult to learn in semester system in such circumstances this research is fruitful and supportive document to learn math in semester system.
- This research helps to all teachers who teach in semester system.
- Also, this research help to find opportunity of semester system that suit in the global teachers' context.
- This research is used to enhance the internal assessment system which is used to increased the quality of education
- This is used to improve in the student's attendance which is helpful to properly managed the classroom
- It is used to maintaining the operational calendar and its implementation
- It is useful to implement the computer technology in the classroom
- It is useful to implement the alternative techniques of instruction .
- This is useful to conduct the curriculum formation and dissemination programmes for the teachers by the Dean's office.
- This research is helpful for planning and implementing of the new programme which is being conducted by the Dean's office.
- It is useful for student in the use of new technology and method of instruction in the classroom.
- This is useful to increase student's efforts to explore something new in their subject matter.
- It is useful to avoid the negligence towards student's academic excellence and achievement.
- This research provide valuable information to teachers, students, administrators, planners for the better implementation of semester system.

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Appendices

Appendix A

Interview guidelines for the teachers

Name:

Designation:

Experience:

Existing practices of semester system in Mathematics Education

-) Existing internal evaluation practices
-) Existing external evaluation practices
-) Existing teaching learning practices
-) Major challenges of semester system
 - Physical challenges
 - Technological challenges
 - Academic challenges
 - Administrative challenges
-) Major opportunity of semester system
 - Physical opportunity
 - Technological opportunity
 - Academic opportunity
 - Academic writing opportunity
-) Process of making semester system students friendly

Appendix B

Focus group guidelines (FGD) for students

Name:

Semester:

1. Enrollment process
2. Assignment and assessment practices
3. Challenges in the semester system
 - Physical challenges
 - Technological challenges
 - Administrative challenges
 - Administrative challenges
4. Opportunity of the semester system
 - Physical opportunity
 - Technological opportunity
 - Academic opportunity
 - Academic writing opportunity
5. How to make semester system students friendly?

Appendix C

Observation checklist

Name:

Date:

Semester:

No. of students

Subject:

Particulars Indicators

1. Engagement of teachers
 - a.Starting classroom instruction
 - b.Regularity of teacher Performance
 - c.Use of materials
 - d.Method and techniques
 - e.Utilization of time
 - f.Relevancy of examples and evidences
 - g.Classroom interaction
 - h.Leading to the class
 - i.Evaluation system
2. Engagement of students
 - a.Classroom discussion
 - b.Interaction with teacher
 - c.Sincere in the subject matter
 - d.Desire to talking out of subject matter
 - e.Curious and enthusiastic
 - f.Cooperative
 - g.Discussion in the classroom
3. Assignment and assessment system
 - a.Internal assignment system

- b. Attendance
 - c. Active participation
 - d. Internal assessment system
 - e. Extra work in the colleges
 - f. External assessment system
4. Challenges in the semester system
- a. Physical challenges
 - b. Technological challenges
 - c. Administrative challenges
 - d. Administrative challenges
5. Opportunity of the semester system
- a. Physical opportunity
 - b. Technological opportunity
 - c. Academic opportunity
 - d. Academic writing opportunity