PROBLEMS ENCOUNTERED BY MATHEMATICS TEACHERS IN

IMPLEMENTING ICTs IN MATHEMATICS CLASSROOOM

A

THESIS

BY

SHAMBU RAM KARKI

FOR THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE

DEGREE OF MASTER OF EDUCATION

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LETTER OF CERTIFICATE

This is to certify that **Mr. Shambu Ram Karki** a student of the academic

year **072/073** with Campus Roll No. **678/072-073**, Exam Roll No. **7228395** and T. U.

Registration No. **9-2-694-50-2012**, has completed his thesis under supervision of Prof.

Dr. Bed Raj Acharya during the period prescribed by the rules and regulations of

Tribhuvan University, Nepal. The thesis entitled "**Problems Encountered by**

Mathematics Teacher in Implementing ICTs in Mathematics Classroom." has

been prepared based on the results of his investigation conducted during the period of

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Tribhuwan University, Kritipur, and Kathmandu. His thesis number is **1682**, I

recommend and forward that his thesis be submitted for an evaluation for awarding

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Date: 21 September 2021

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LETTER OF APPROVEL

This thesis entitled "**Problems Encountered by Mathematics Teacher in Implementing ICTs in Mathematics Classroom**" submitted by **Mr. Shambu Ram Karki** in partial fulfillment of the requirements for the Master's Degree in education has been approved.

Viva-Voce Committee	**Signature**
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2. Prof. Dr. Binod Prasad Dhakal (External)	………………………….
3. Krishna Prasad Adhikari (Member)	………………………….

Date: 04 October 2021

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RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. **Shambu Ram Karki** has completed his M.

Ed. thesis entitled "**Problems Encountered by Mathematics**

Teacher in Implementing ICTs in Mathematics Classroom" under

my supervision during theperiod prescribed the rules and regulations

of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend

and forward his thesis to the Department of Mathematics Education to

organize final viva-voce.

……………………………

(Prof. Dr. Bed Raj Acharya)

Supervisor

Date: 04 October 2021

DECLERATION

I would like to dedicate this dissertation to my parents Rup Bahadur Karki and Bishnu Maya Karki and my brother Raj Kumar Karki who modeled for me the joy of learning, for their unflagging support and devoted their lives for making me who I am now.

DECLERATION

I declare that the thesis has been composed by me and that the work has not be submitted for any other degree or professional qualification. I confirm that the work submitted is my own, except where work, which has formed part of jointly authored publications, has been included.

…..………………..

(Shambu Ram Karki)

ACKNOWLEDGEMENT

ABSTRACT

This dissertation investigates the "**Problems Encountered by Mathematics Teacher in Implementing ICTs in Mathematics Classroom**" who use ICT (Information and Communication Technology) in the mathematics classroom. The purpose of this study was to identify major problems encounter by teachers in implementing ICTs in Mathematics classroom and to explore the opportunities obtained by mathematics teacher using ICTs in mathematics classroom. The study field of this research was selected in Melamchi municipality of Sindhupalchok district. I used purposive sampling under qualitative research design through the interview guideline and focus group discussion to explore the views from the participants to know their problems towards implementing ICT in the mathematics classroom. I analyzed data through the thematic way. Then it was found that, lack of training to implement ICT in mathematics classroom, lack of infrastructures and technical supports, lack of confidence and competency of teachers on ICTs, implementation in mathematics classroom, challenges of time management, challenges on engagement of learners and adapting unfamiliar technology were the major problems encounter by mathematics teachers in implementing ICTs in mathematics classroom. Similarly, student motivation, increase self independence, best opportunities for jobholder, develop the knowledge and skill, use of ICTs saves expenditure in learning, opportunities for collaboration, promote and improve the digital culture in schools, were the opportunities obtained by mathematics teacher using ICTs in mathematics.

TABLE OF CONTENTS

ACRONYMS

APA	American Psychological Association
Bed	Bachelor of Education
BECTA	The British Educational Communications and Technology Agency
TPACK	Technological, Pedagogical, and Content Knowledge
ICT	Information Commutation and Technology
KU	Kathmandu University
Med	Master of Education
NCTM	National Council of Teachers of Mathematics
QCA	Qualifications and Curriculum Authority
SLC	School Leaving Certificate
TU	Tribhuvan University
UNESCO	United Nation Educational, Science and Cultural Organization
FDG	Focus Group Discussion

CHAPTER I

INTRODUCTION

Background of the Study

"There may be infinite uses of the computers and new-age technology, but if teachers themselves don't seem to be ready to bring it into the classroom and make it work, then it fails." (Kassebaum, 2012). Information and Communications Technology (ICT) can affect student learning when teachers are digitally literate and understand a way to integrate it into the curriculum. Schools use a various set of ICT tools to speak, create, disseminate, store, and manage information. The use of ICTs tools proved that an increase in the use of ICT in education with integrating technology into the curriculum has a significant and positive impact on students' achievements. ICT is a scientific, technological, and engineering discipline and management technique used in handling information, its application, and its association with social, economic, and cultural matters (UNESCO, 2002). The results specifically showed that the scholars who are continuously exposed to technology through education have better 'knowledge, presentation skills, innovative capabilities, and are able to take more effort into learning as compared to their counterparts.

The dissemination and use of data and communications technologies in schools had seen by education policy-makers as a big opportunity. They're are interested in the prospect, that ICT can improve student achievement, improve access to schooling, increase efficiencies and reduce costs, enhance students' ability to find out and promote their lifelong learning, and prepare them for a globally competitive workforce. Because the power and capability of computers have increased and that they become interconnected in a very worldwide web of knowledge and resources, as

they supply a conduit for participation and interaction with others, as they need become linked to other devices, and as their costs have come down, policy-makers, particularly those in developing countries have come to determine ICT as a viable and even dramatic way of responding to the multiple challenges that they face. There has been an vital role of the use of Information and Communication Technologies (ICTs) in schools for teaching a learning process, particularly in mathematics to grasp the concept and abstract ideas (Leung, 2006;Fathima, 2013) (Faggiano & Ferrara, 2017). ICT could be a broad concept that refers to the mixture of hardware, software, and communication, which represents the gathering, storage, processing, transmission, and presentation of information. It's wont to convey, manipulate, and store data by electronic means [United Nations Educational Scientific and Cultural Organization (UNESCO), 2006].

Hence, wide sorts of ICTs tools are email, internet, SMS, videos, social media, e-learning, multimedia, software programs, and mobile applications, etc. (Mathevula & Uwizeyimana, 2014), Therefore, realizing the significance of ICTs in teaching-learning processes, the state of Nepal has formulated several policies and plans such as IT Policy (2010), Five Year Plan 2019-2024, ICT Master Plan (2013- 2017) and latest School Sector Development Plan (SSDP)(2017-2023) for promoting ICT integrated teaching and learning a MoE's vitas. MoE (2016) policy has considered that ICT is an effective tool for educational transformation through an improved teaching-learning process for students' better understanding (p. 12). Due to this, MoE has established ICT lab and internet connectivity for those schools. National Center of Education Development (NCED, 2015) also provided ICT integrated pedagogical training to the teachers of schools where there were ICT connectivity's in public secondary and lower secondary schools. In the process, very few public secondary

schools teachers were trained general including mathematics teachers. However, the implementation of ICT-based pedagogies has been less effective in the mathematics classroom due to several barriers. The use of these ICT tools is widespread particularly in mathematics classrooms for meaningful teaching and learning in developed countries by investing in heavy ICT infrastructures, software equipment, and frequently professional developments of teachers (Andoh , 2012). School is facilitating children with every required ICT service as per the digital native's wish (Curtis, 2014). Although there is a great technological difference between developed and developing countries like Nepal, they were being challenged in closing the technological gap (Giller, 2014). However, for the effective use of ICT tools in teaching and learning activities particularly in mathematics classrooms, teachers have been facing a number of difficulties such as lack of teacher training, non-conducive school environment, and disempowering school leaders for implementation of ICT tools (Msila, 2015).

As per my experience, there are several challenges while using ICTs in teaching mathematics such as lack of confidence and competency of teachers on ICTs, lack of infrastructures and technical supports. Moreover, teachers' perception of usefulness, ability to innovate, expertise, attitudes, Technological, Pedagogical, and Content Knowledge (TPACK), level of engagement, the shift in technological beliefs about teaching and learning, and feelings in relation to ICT are the major important aspects that lack while using ICT in teaching and learning mathematics (Wachira & Keengwe, 2011). I believe in that only available hardware, means of program software and other related tools might not work themselves that teachers need to be well confident but a problem occurs in the Nepalese context mathematics teachers have lack of knowledge of TPACK for the sound delivery of the contents (Singh &

Chan, 2014; Ling Koh, Chai, & Chun, 2013). My focus of inquiry in this paper is to identify major problems encountered by teachers in implementing ICTs in mathematics classrooms. In addition, explore the opportunities obtained by mathematics teacher using ICTs in the mathematics classroom, based training in a mathematics classroom in teaching and learning particularly in the public schools of Sindhupalchok district of Nepal. After doing so, I have got addressed the research questions: How are the challenges that the teacher faced in teaching mathematics through using ICTs? Additionally, how are the teacher get opportunities while teaching mathematics using ICTs?

Introduction of Information and Communication Technology

Technology is that the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, methods of organization, to universal an issue improve a preexisting solution to a problem, achieve a goal, or perform a specific function. It can also refer to the collection of such tools, machinery, modifications, arrangements, and procedures (ICT Act 2010). The use of technology when studying mathematics is not a new issue, since humankind always has been looking for solutions to avoid time-consuming routine work. The use of technology has a long history in mathematics education. Starting from magic slate, book, magic lantern, blackboard, radio, slide rule videotape, television, calculator, computer, interactive board, apple i- pad all come under technology. Paper currency and coins, beans, bears, buttons, and other small items are helpful for counting and computation skills. Garboards are useful for introducing geometric concepts. Clinometers are useful for teaching and learning trigonometry. For thousands of years, humans made presentations using only the tools they were born with: their voice and body.

That was followed by tools like chalkboards and projectors, and so by digital tools like power point. More recently, other tools have emerged, like slide rocket, animator, and magic magnify. Since the 1980s, the importance of computer support in the teaching and learning of mathematics has been emphasized more and more. Information and Communication Technology (ICT) is an umbrella term that encompasses all communication technologies like the internet, wireless networks, cell phones, satellite communications, digital television computer, and network hardware and software; likewise because the equipment and services related to these technologies, like videoconferencing, e-mail and blogs, etc. that provide access to information.

Statement of the Problem

Knowledge is expanding day by day so teaching becoming one amongst the foremost challenging professions in our society. While learning mathematics, learners expect facilitators to facilitate meaningful learning instated of just knowledge and skills. During this modern period, the use of ICTs in teaching mathematics provides new possibilities within the teaching profession. UNESCO (2009), states that the use of ICT promotes the standard of education. That's why mathematics teachers should be providing with different professional development training including the utilization of ICT within the mathematics classroom. According to the demand of time, in the context of Nepal, the standard of education is poor and one among the approaches to deal with this problem is to integrating ICT based teaching-learning approach to urge quality in education (Bhatt, 2008). The long-term goal of education in Nepal is to produce citizens with the acceptable knowledge, skills, and attitude require to figure actively with in the development of the country and to integrate Nepal into the worldwide

community through ensuring equitable access to and quality of education for all, particularly the specialize in basic education. The interim constitution of Nepal 2007 has considered education as a fundamental right of the people. The utilization of data like, Information and Communication Technologies (ICT) in education has been considered in concert strategies to realize the broader goals of education. This research aims to provide information found on the difficulties that teachers encounter in using ICT in their teaching-learning process. Since confidence, competence and accessibility are critical components for technology integration in institutions, ICT resources including software and hardware, effective professional development, sufficient time, proper training, and technical support must be provided to teachers. No component in itself is sufficient to supply good teaching. Teachers face many problems in mathematics classrooms while introducing ICT tools. Teacher is in trebles due to lacking sufficient knowledge and trains associated with ICT. Therefore, the training of teachers in using ICT in their teaching-learning process should be increase in accessible ways. Teachers must cash in of ICT resources offered at institutions. In additionally, there are opportunities for teachers while engaging in ICT based classroom like, student motivation, effective collaboration and opportunities for learners. Finally, teachers should acquire skills of self-organization, which can help them an excellent deal in conducting their classes when using ICTs.

Objective of the Study

The purpose of this study was to examine the challenges and opportunities to ICT use in teaching and learning mathematics in secondary schools. Specifically, this research focused on school-related and teacher-related

challenges and opportunities towards ICT in teaching and learning mathematics. Therefore, the main objectives of this study are as follow:

1. To identify major problems encountered by teachers in implementing ICTs in mathematics classroom.

2. To explore the opportunities obtained by mathematics teacher using ICTs in mathematics classroom.

Research Questions

1. How are the challenges that the teacher faced in teaching mathematics through using ICTs?

2. How are the teacher get opportunities while teaching mathematics using ICTs?

Justification of the Study

It is very important to study certain issues in detail that help to identify the problems related to the issue and adapt the suitable plans and pedagogies to bring out improvement of the existing system. Therefore, the significance of this present study is to use ICT in mathematics to identify major problems encountered by teachers in implementing ICTs in mathematics classrooms. This 21st century is the age of technology everywhere there is a use of technology and, it is one of the basic needs of everyone, I hope this research will be helpful for many students, teachers, educators, policymakers, and so on as well as it is very helpful for me too for my career in the teaching profession.

By the use of ICT, an image can easily be used in teaching and improving the retentive memory of students, also teachers can easily explain complex instructions and ensure students comprehension, as well as teachers, can create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration and other people who are interested to understand the problems

encountered by a mathematics teacher in implementing ICTs in the mathematics classroom. The mathematics teachers encounter many problems in teaching. Problems may arise because of the lack of knowledge about classroom management. The study will be contributed a lot to identifying problems once they know what they are. Thus, the study is significant for the reason that it will help to provide information to the concerned agencies to reform and improve the mathematics teaching at the secondary level through implementing ICTs in the mathematics classroom. The significance of this study is presented in the following ways:

This study helped identify major problems encountered by teachers in implementing ICTs in mathematics classrooms. This study helped to explore the opportunities obtained by mathematics teachers using ICTs in mathematics classrooms.

Delimitation of the Study

In this research, I have been concerned with the problems encountered by mathematics teacher implementing ICTs in a mathematics classroom in the secondary level of The Sindhuplachok district where one can observe the use of ICT in the mathematics classroom. The use of ICT can be seen from various perspectives in mathematics however my study is focused on problems related to mathematics teacher in implementing ICTs in the mathematics classroom. The delimitation of the study is presented below.

- The study was limited to the government school only.
- The study was limited to the Sindhupalchok district.
- The study was concerned only with classroom teaching through ICTs implementation in the mathematics classroom.
- This study was based on a qualitative design.

- This study was delimited to compulsory mathematics only.

- This study was delimited limited to the secondary level only.

Definition of Key Terms

The meaning and definition of terminologies used in this study differ from discipline to discipline and from person to person. However, the terminologies were defined here from researcher's perspective. Such terminologies were defined as follows:

Teacher. The person who teaches mathematics at secondary level in Sindhuplachok district

Problem. A situation is unsatisfactory and difficult for teacher in teaching

ICT. Information and Communication Technology

LMS. Learning management system

Pedagogy. The method and practice of teaching, especially as an academic subject or theoretical concept.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The literature review is one of the essential aspects of my research. A literature review is a written summary of journals articles, books, and other documents that describes the past and current state of information on the topic of your research study (Creswell, 2012). Therefore, the literature review is the search, study, and analysis of the existing knowledge in the area of the research problem. In addition, it helps for finding what the earlier researchers have done in the related problem issue and determining the gap as well. The main objective of the literature review is to enhance the level of understanding of the various theoretical as well as conceptual constructs of the present study that is it is a theoretical framework. In this section, I describe the literature related to this are classified into two types Empirical and theoretical. A literature review is an important source of further research study. It helps to researcher better perspective and is essential for guidance for the research plan. I have reviewed some kinds of literature, which was related to my study.

Review of Empirical Literature

Information and communication technology (ICT) has been identified as an integral part of the new curriculum for mathematics. Teachers are now encouraged to incorporate ICT in teaching programs to support and enhance student learning and their engagement with mathematics (VCAA, 2011). In addition, Romeo (2009, p. 43) pointed out that: "*ICT produced increased motivation, improved behavior and an improved paced of work in the students, especially apparent in those groups that were characterized by a lack of interest in learning mathematics*"

The ICT integration for the pedagogical practices needs to concern the system as a whole. Andoh, (2012) mentions that the concept of integration of ICT in general and

mathematics in particular for teaching and learning appropriate technology and technology-based practices into all aspects specifically in the content, pedagogy, and assessment to improve quality. However, students also might be used verities of websites or ICTs tools (messenger, internet, CD ROMs, videos, mobiles, and laptop), multimedia, and social media for self-learning. For this study, I followed the Saltan and Arslan definition of ICT integration by ICT trained secondary level teachers in the mathematics lessons for teaching and learning practices in the classroom. The integration of ICT into the teaching and learning process is complex, expensive, and difficult that has been identified by many researchers. Bingamils, (2009) identified problems and challenges to integrate technology for teaching and learning in the classroom influencing different factors such as school level, teacher level, and system level. However, Al-Faki & Hassan (2014) identified user characteristics, content characteristics, technological considerations, and organizational capacity as major factors that influenced the integration of ICT into classroom teaching in general and mathematics teaching in particular.

Key Challenges on ICT Use

Mathevula & Uwizeyimana (2014) argued that teachers' self-efficiency and confidence are one of the key challenges of the use of ICT in teaching-learning activities. Teachers who don't have general ICT literacy skills such as typing, use of the internet for searching materials, downloading, email, word processing, etc. are major predictors (Yang & Leung, 2015). However, teachers who have less interest and are incompetent are less able to increase self – confident discourage them to make the decision (Asabere, Ahmed, 2013). Moreover, Bas¸ Kubiatko, & Sün, (2016) argued that teachers with more experience in technology and more engagement have greater confidence related to their perceptions and their ability to use in the classroom.

However, plenty of available time for work and training are also essentials. Mishra and Koehler (2006) argued that technology enhances pedagogies teachers need appropriate knowledge with a combination of pedagogy and technology to support students in working with specific subject content that gives more priority to knowledge, competences, and skills of teachers who received. Those teachers who believe and use technology for instructional support, she/ he might have external expectation more than who tough teacher-centered (Voogt, &McKenney, 2017). Hence Philomina & Amutha, (2016) claim that TPACK is essential but not sufficient for teachers to become creative or innovative in their thinking and doing about using technology for intellectual needs" (p.605).Therefore, the knowledge of TPACK holds higher value in technology-enhanced classrooms but does not apply to every teacher while using only a single transformation of content or pedagogy or technology. (Koehler&Mishara, 2009; Kipsoi,Chang'ach& Sang, 2012), For this, autonomy, capability, and creativity are the three important components to develop quality.(Kihoza, Zlotnikova, Bada, & Kalegele, 2016), Teaching with technology demands deep knowledge of processing subject matter contents

(Alayyar, Fisser , & Voogt, 2012; Kihoza, Zlotnikova, Bada, & Kalegele, 2016)) ,However incorporate technology for meaningful teaching mathematics seem challenging for many mathematics teachers in the context of Nepal.In addition, time for training, level of training, lack of specific resources is other challenges. (Parajuli, 2017), Technology is introduced into the teacher training programs but trainers are often focused on teaching about technology instead of teaching with technology. (Parajuli, 2017), Hence, inadequate training on a specific subject through well resource persons might be the major problem for not being able to implement ICT based training by the secondary level mathematics teachers in the classroom practices

in the Nepalese Context. One of the key challenges to implement ICT in mathematics classroom for teaching and learning is lack of ICT infrastructures, unavailability, and less accessibility.

The available infrastructures also do not work properly in the classroom that hinders teachers to make their proper use (Tondeur, Baruch & Prestridge,2016). On the other hand, for proper implementation of ICT, students also need ICT tools to develop their ICT skills and knowledge for preparing an assignment, searching materials, and presenting in the classroom in innovative ways (Simmons, & Hawkins, 2010). But due to lack of access to ICT and lack of ICT-enabled school environment, teachers and students have been facing more challenges to implement ICT in mathematics classroom practices. Etambo, Kapkiai, & Daniel, (2016) argued that technical challenges are one of the top barriers that are influencing mathematics teachers while integrating ICT into the teaching of mathematics. They argued that absences of technical assistance and good technical support might be disturbances and teachers could not be accepted to overcome the obstacles that could discourage on using ICT instruments due to fear of failure and breakdowns in work(khan, Hasan,Clement,2012). According to Becta, (2006) mention that "If there is lack of available technical support in schools, technical maintenance will not be carried out regularly resulting in higher risk of technical breakdowns" as cited in (Andoh, 2012, p. 144) that barriers impeded the smooth delivery of the mathematics lessons or the neutral follow of the classroom lessons due to this reasons teachers might be frustrated that encourage to reluctance in the use of ICT in the lessons (Asabere & Ahmed , 2013). Hence the availability and accessibility of computers technology in schools, as well as technical support, are needed to the teachers for maintenance and ordinary support.

Thematic Review

"In a thematic review of the literature, the researcher identifies a theme and briefly cites literature to document this theme" (Creswell, 2011). According to my research purpose, I searched for existing literature from different resources, which were supportive of my research study. According to my research questions, I went through different related materials for literature review that were the use of ICT in Classroom. Problems encounter by mathematics teachers in implementing ICTs in mathematics classrooms will be discuss in the following.

ICT Tools

ICT is changing the processes of mathematics teaching and learning by adding elements of vitality to classroom education environments, including virtual environments for the purpose. The new digital ICT is not a single technology; it is a combination of hardware, software, multimedia, and delivery systems. Today, ICT in education encompasses a vast range of rapidly evolving technologies such as Desktop, notebook, and handheld computers, digital cameras, the internet, cloud computing, the world wide web, spread sheets, tutorials, simulations, email, local area networking, Bluetooth, streaming, and DVDs; and applications such as word processors, virtual environment, simulator, digital libraries, computer-mediated conferencing, videoconferencing, emulator, etc. ICT allows for the production of digital resources such as digital libraries, where students, teachers, and professionals can access study material and course material from anywhere at any time.

The Use of ICT in the Mathematics Classroom

The use of ICT in the mathematics classroom has primarily held of particular concern to mathematics educators. Some examples of the use of ICT in

maths were portable, graphic calculators, computerized graphing, specialized software, spreadsheets, and databases, etc. By using ICT as a tool for learning, those teachers can maximize the impact of ICT in mathematics education (Becta, 2003). Students were taught to work in collaborative groups or apply the problem-solving process when using a computer to solve a problem, and then ICT is involved in developing the solution. Higher-order thinking of math students consists of the transformation of information and concepts. This transformation occurs when students combine information ideas, synthesize, generate, interpret, estimate, or reach a conclusion or interpretation. Managing data and thoughts through these processes enable students to solve problems, gain understanding, and discover new meaning. ICTs was the most powerful when used as a tool for problem-solving, conceptual development, and critical thinking in mathematics. Using ICT as a tool, students spend productive time developing strategies for solving complex problems and develop a deep understanding of the various mathematics topics.

Use of ICT for Conceptual Understanding of Mathematics:

Poudel, (2015) mentioned in his paper that "By the use of ICT image can easily be used in teaching and improving the retentive memory of students, also teachers can easily explain complex instructions and ensure students' comprehension, as well as teachers, can create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration" (page.22).

The effectiveness of online or blended professional development programs lies primarily on the use of technology to form a community of learners where teaching staff learn (Schlager, Fusco, & Schank, 2002), and it should facilitate the social construction of knowledge (Lloyd, 2000) through online discussion and peer

support. It shows that the ICT is for online interaction and is possible to take the class from international universities from any part of the world. According to the master plan (2013-17), the GON has a policy that each teacher-training centre will have at least one ICT master trainer. The master trainers at the teacher training centers are highly trained ICT human resources in the ministry. They will train ICT teachers, general subject teachers, and trainers from resource centers. It shows the initiation from the government of Nepal has in the conceptual learning of teacher professionals. As per the conceptualization of the content encourage the students to learn the content globally and create a forum to share the ideas of learning through the different social media like Skype, what etc. Students share the content through Skype conference in the classroom and interact with each other .This interaction allows them to understand each other's unique context and experience in blended or online learning, which consequently expands their knowledge. From anywhere at any time.

Challenges of using ICT

(Dhital, 2018).The development of information and communication technology in Nepali education system is faced with many challenges. So far, ICTs have not been used as a way of gaining new knowledge and skills in schools, due to inadequacy of curriculum content and limited access to ICT. Other challenges in using the ICT in teaching mathematics includes the size of classroom, Infrastructure and funding, lack of qualified personnel and lack of policy formulation and implementation.

Constructivism

The word "construct" is to form or make something. We always use this word in our existence. Within the sector of education, "construct" means to develop s thought or a belief that has supported various pieces of evidence, which don't seem to be

always true. Many Theories/approaches are introduced in teaching/learning field. The "Constructivism" has also developed as a philosophy in numerous disciplines. It has become a strong means in teaching/learning approach. Now of view maintains that folks actively construct new knowledge as they interact with their environment. Constructivist theory of learning believes that the knowledge were often developed within the classroom, being participated in several activities, using different learning agents and thru different meaning making processes. One among the key assumptions of constructivism is that "Knowledge is symbolically constructed by the learners who are making their own representations of action" (Gagnon, 2012)

Principle of constructivist learning theories is that the learner's own active initiative and control in learning, and private knowledge construction that's self-regulation of learning (Chan, 2002, p. 3). Most of the educators utilizing a constructivist perspective may emphasize a lively learning environment , which will incorporate learners centered, and problem based learning within which students are actively engaged in critical thinking activities so use of ICT in classroom relies upon the assumptions of constructivism where teachers should play role of instructor and students are actively participate in classroom. In constructivist classroom, student attempt to find the answer of the issues by learning in an exceedingly group where students are motivated to try to to their work themselves and find the answer and teacher work is simply to facilitate the student. By using ICT in math, classroom student will develop their knowledge by visualizing and here teacher role is simply as a facilitator. Further, during this sort of constructivist class student are motivated to share their ideas, expand their knowledge through ICT or by utilizing their experience (Tyler, 2002). bushed all ICT supports constructivist pedagogy where students use technology to explore and reach an understanding of mathematical

concepts where it promotes higher order thinking and better problem solving

strategies. (lttigson & Zewe, 2003).

Collaborative

Now during this 21st century, collaboration approaches in

mathematics similarly as in other subjects are also very essential and it helps to

market learning and make easy environment with learner and facilitator. "Group

learning is more authentic because it more closely approximates work palace

activities and adult learning "(Tobin, 1993 p. 108). Piaget also advocates that

learning is that the active participation of learner not the passive receiving

facts. During a collaborative classroom teacher is simply a mediator and within

the presence of teacher, students were discussed the subject given by teacher and that

they can generate their own concept regarding that topic by discussing among their

group activities so use of ICT in classroom relies upon the assumptions of

collaborative approach. In line with BECTA (2003) by using ICT in mathematics,

classroom students in pairs or groups teachers are ready to gain deeper insights into

students understanding and progress. Therefore, by using ICT resource is ready to

assist to understanding and learn from such collaboration.

Review of Theoretical Literature

The number of books, research reports, and papers, and other booklets can be

found that concern with curriculum instructional materials method so on. Especially

few of them have been done in the related field. A review of some related literature

was cited below:

Baral, (2008) within the study, "Problem encounter by teacher in teaching

mathematics" indicated that there have been several problems associated with

curriculum designing, textbook writing, pedagogy, classroom situation, students

background, teaching materials, teachers training, and so on.

Dahal, (2015) within the study, "Opportunities and Challenges to ICT in Nepalese Mathematics Classroom " indicated that there have been several challenges associated with quality environment, trained teachers, diversity in language, geographical diversity, infrastructure, attitude of students and economic readiness are the challenging factors in Nepalese classroom.

Dhital, (2015) within the study, "Opportunities and Challenges to Use ICT in Government School Education of Nepal" indicated that there have been several challenges and opportunities related to the challenges facing in use of ICT in government school education of Nepal. It identifies how ICT can be used to enhance quality education of presidency schools in Nepal. Problems such associated with lack of resources (viz. qualified teachers, hardware, software, electricity etc.) and poor project implementation strategies militate against these efforts. This study recommends that both government and non-government organizations should help to facilitate skilled work force, stabilized electricity supply, hardware resources and software resources to enhance the use of ICT in government schools.

Simin ,(2018) "Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions the key issues and challenges" found to be significant in using ICT tools by teachers were limited accessibility and network connection, limited technical support, lack of effective training, limited time, and lack of teachers' competency.

Gilbert, (2015), conducted a thesis entitled "Online Learning Revealing the Benefits and Challenges" concluded that the expansive nature of the Internet and the accessibility of technology have generated a surge in the demand for web based teaching and learning. Online education is quickly infiltrating into school districts and

colleges across the nation.

Online courses have the potential to open the pathways for more opportunities for students in "small, rural, or low socioeconomic school districts" (Chaney, 2001, p. 21) to take courses that generally would not be offered. A growing concern that the United States is losing its competitive edge in the overall preparedness of high school graduates in the global market may be able to close the gap and lessen the financial burden by providing more opportunity for a lesser cost (Bowen, et al., 2014). The expansiveness of distance education may be delivering the transformation that education has been waiting for, slowly breaking down the financial and vocational barriers that have acted as hurdles and at times, unsurpassable barricades to equal opportunities and quality education for all students.

Simin ,(2015) mentioned in a writing "Challenges Facing Maths Teachers in ICT Integration: A Comparative Study on Secondary Schools in Kuala Lumpur" face challenges that are mostly relate to the net services, speed, and ICT facilities as an example number of computers connected to internet and insufficient resources. Moreover, the lesson time, which is fixed and equal everywhere the country, also makes pressure for Math's teachers in using ICT to arrange the students for exam. This shows that the mathematics teacher in capital of Malaysia is more exam oriented and lack of ICT integration. It is because of the average in capital of Malaysia, which is beyond in compare to Kota Kinabalu.

Afiqah and Khalid,(2016) mentioned in a piece of writing "The Benefits and Constraints of the use of Information and Communication Technology (ICT) in Teaching Mathematics" It attracts students' interest in learning mathematics; it increases their motivation and performance; it encourages lifelong learning; and it facilitates positive interactions and relationships. Nevertheless, mathematics educators

have faced a few constraints during teaching processes involving ICT. Identified constraints and limitations are Educators lacking knowledge of ICT; minimal training and opportunities for learning about ICT; and limited technical support. Therefore, it's suggested within the literature that there's a desire for a rise in training for mathematics educators in terms of computer usage and ICT applications for teaching purposes.

Theoretical Referent: Constructivism

According to (Wang, et al, 2012), constructivism is that the process of information construction by actively engaging learners to develop higher-order thinking skills through interaction and conversations with one another (p. 126). It believes that students construct new knowledge, actively supported their current and past experiences (Savasci & Berlin, 2012). Social constructivists believe that knowledge is inter-subjectively constructed through the "social speech, personal speech and silenced speech" (NCTM, 2000 as cited by Jones & Araje, 2002, p. 9). To construct their mathematics knowledge actively, the role of the teacher is to guide students. Students become engaged find new knowledge by applying their existing knowledge and real-world experience (Kuter, Gazi, & Aksal, 2012). Learning may be a social process; students have to have opportunities to interact in substantive conversations to exchange their ideas. Teaching mathematics through software promotes child-centered pedagogy (Goos, 2010). Consistent with Wachira & Keengwe, (2011) to shifts within the learning paradigm technology supports teachers for positive impact because the constructivist approaches of teaching instead of lecturers. However, the teacher's role is to encourage and facilitate the event of student's mathematical identity, connecting students and subjects. She/he can play a distinct role to have interaction students for creative learning activities and to

indicate their abilities for meaningful learning (Grootenboer and Marshman, 2012).

Therefore, this theory supported me to know and observe participants on ICT- based

mathematics teaching and learning within the classroom practices. During

this context, I used specific theories as references from the humanistic

perspective like constructivism that supported me to work out the combination of

latest technological tools (ICT) in teaching and learning to elucidate the ICT

integrated classroom practices, which provided me the various lenses to seem on

challenges of integrating ICT in mathematics teaching-learning activities.

Conceptual Framework for the Study

Conceptual framework represents the map of research objectives, get the answers

to research questions, and perform the research work as a full smoothly (Acharya,

2015). Supported theoretical review reviewed in second chapter of this study, the

relation between methodological process and variables/ research problems was

shown within the following mental figure of researcher to urge expected output.

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┌─────────────────────────────────────────────────────┐
│      Exploring mathematical concepts using ICTs       │
│                  in classroom                          │
└─────────────────────────────────────────────────────┘
                          ↕
┌──────────────────┐  ┌─────────────────────────┐  ┌──────────────────┐
│ Purposive        │↔ │ Problems and            │↔ │ Constructivism   │
│ Sampling         │  │ opportunities           │  │                  │
│                  │  │ encountered by          │  │                  │
│                  │  │ mathematics teacher      │  │                  │
│                  │  │ using ICTs              │  │                  │
└──────────────────┘  └─────────────────────────┘  └──────────────────┘
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┌──────────────────┐ ┌─────────────────────────┐
│ In -depth   │ │ Focus group discussion   │
│ Interview   │ │   │
└──────────────────┘ └─────────────────────────┘

┌─────────────────────────┐
│   Data collection   │
└─────────────────────────┘

┌─────────────────────────┐
│ Data analysis &   │
│ interpretation   │
└─────────────────────────┘

┌─────────────────────────┐
│   Conclusion   │
└─────────────────────────┘
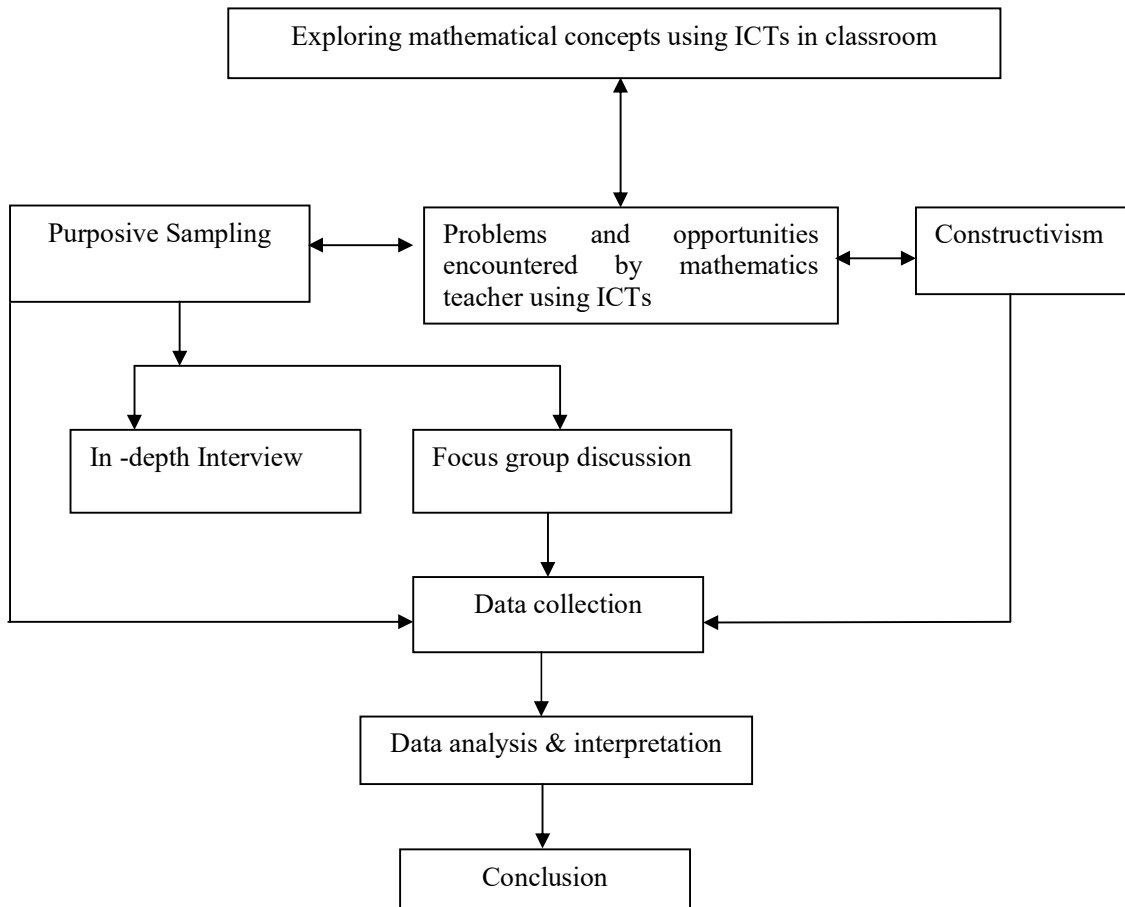
Teachers' comfortability was defined by their attitude and belief. A teacher's attitude may have a negative or positive impact on the levels of ICT integration in teaching and learning Mathematics. The teacher's comfort ability was influenced by her/his knowledge. Teacher knowledge was defined by pedagogical knowledge and skills on the use of ICT infrastructure that is available for use. Administration support affects both teacher knowledge and the accessibility of ICT infrastructure. If the teacher knowledge is limited, the teacher will avoid accessing the ICT infrastructure. A teacher who lacks confidence will not effectively teach mathematics using ICT infrastructure. The outcome depends on the intervening variables of accessibility, competence, confidence, administration, teacher's knowledge, and teacher's comfort ability.

CHAPTER III

METHOD AND PROCEDURE

"The proper methodological dimensions should also discuss why the data-gathering (and analysis, and interpretation) was taken during this way. In other words, what are the philosophical and intellectual foundations of this particular research practice?" (Madden, 2009). Thus, research methodology refers to the philosophical and intellectual framework about a way to collect the information for the concept of our research study that guides us to conduct the research study. This chapter covers the methodological problems with this research. Any research or study relies upon some core research ideas. Certain paradigms are going to be followed which provides a transparent direction on how the research study has proceeded. Additionally to that, this chapter contains methods that I employed while collecting data. To explore my experience that dictates the context of the study, the following section discusses my methodology, ontological and epistemological stance, axiology for the proposed research. This chapter will accommodate research design, methods procedures, study site, the sample of the study, and tools of knowledge collection, data collection procedure, data analysis, and interpretation.

Design of the Study

I used interpretive inquiry as an approach of research, which allowed me to explore and understand the subjective worldview from my participants' perspectives (Hartas, 2010) on the problem of challenges encountered by mathematics teachers in implementing ICTs in their classrooms. It facilitated me to adopt an emergent inquiry of the sphere (Taylor, 2018, p. 42) to explore the participants' thick description (Flick, 2009) on the research issue. Further, it allowed me to capture their

Individual life-world experiences in subjective ways (Scotland, 2012) from the insider

(Taylor, & Medina, 2013, p. 4). In doing so, I engaged meaningfully within the field

for an extended period with four ICT-trained secondary mathematics teachers

where they had worked. It absolutely was understood and that, I observed problems

and challenges encountered by them while implementing ICT training within

the mathematics classroom. I adopted in-depth interviews and informal conversations

several times with careful and engaged being attentive to capture the realities (Forsey,

2010) through ongoing story records (Clandinin, Pushor & Orr, 2007). Providing

coherence within the write-up. Then, I produce evocative thick descriptions of non-

public and interpersonal experiences. I presented the ICT-trained teachers'

experiences through storytelling (Ellis, Adams, & Bochner, 2010).Sample of the

Study Qualitative research data confer with the opinions and feelings of the

important world obtained from the face-to-face and in-depth interview of the

participants that was the more feeling of a personal were appreciate within

the qualitative research.

Study Site

I am from sindhupalchok district, which is additionally referred to as first literate

district of Nepal. in step with Shikhya Darpan 2075/076, published by education

development and co-ordination unit, Sindhupalchok, there are 495 secondary

schools within the Sindhupalchok district. Twenty schools from 495 schools within

the Sindhupalchok district were selected for sample by the Purposive sampling

method. it absolutely was bounded on Melamchi municipality's public and

personal school.

 Respondents of the Study

This is qualitative research design on problems encountered by mathematics

teachers in implementing ICTs in mathematics classroom. The population of the

sampling was expounded to five mathematics teachers of public and

personal school of Melamchi municipality. i select 20 mathematics teachers from

some different schools of Melamchi municipality. From those 20 schools,

a teacher who teaches compulsory mathematics in school 9 or 10 were selected as a

sample of the study. From those twenty teachers, five teachers were selected for an

interview.

Data Collection Tools

The following tools and instruments were constructed supported need and

characteristics of the sample chosen and were used for data collection:

(i) In-depth interview schedule

(ii) Focus group discussion

the researcher himself with the assistance of the supervisor developed the interview.

With the supported conceptual frame and associated with various problems and

opportunities, which are being encountered, by mathematics teachers using ICTs in

mathematics classroom in Sindhupalchok district? the issues was associated

with lack of coaching in implement in ICT in mathematics classroom, lack of

infrastructures and technical supports, lack of confidence and competency of teachers

on ICTs, implementing in mathematics classroom. similarly, student motivation,

increase self independence, best opportunities for jobholder, develop the knowledge

and skill, use of ICTs saves expenditure in learning, opportunities for collaboration,

promote and improve the digital culture in schools, were the opportunities obtained

by instructor using ICTs in mathematics. At the top of every section of the in-depth

interview, and focus discussion group, I collected problems and opportunities using

ICTs within the mathematics classroom. The interview schedule was used for the

qualitative information by using purposive sampling. Five teachers were

selected so interview for this purpose. The open-ended questions were asked to them

with the assistance of interview guidelines that were developed by the researcher

himself with the assistance of the supervisor. Mathematics teachers while teaching

mathematics using ICTs at the secondary level constructed interview guidelines in

such a fashion that they may find the issues and opportunities with its causes

encounter.

(i) In-depth interview schedule

      In-depth interviews are a qualitative data collection method that enables for the

gathering of an oversized amount of knowledge about the behavior, attitude, and

perception of the interviewees. During in-depth interviews, researchers and

participants have the liberty to explore additional points and alter the direction of the

method when necessary. An independent research method can adopt multiple

strategies consistent with the wants of the research. In this paper, I prepared interview

schedule to the teachers with the suggestion of my supervisor. During that period, I

met different school mathematics teachers.

(ii) Focus group discussion

      A focus group discussion involves gathering people from similar backgrounds

or experiences together to discuss a specific topic of interest. It is a form of qualitative

research where questions are asked about their perceptions attitudes, beliefs, opinions,

or ideas. In a focus group, discussion participants are free to talk with other group

members; unlike other research methods, it encourages discussions with other

participants. It generally involves group interviewing in which a small group of

usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured

discussion of various topics of interest.

Data Collection Procedure

The researcher visited sample schools on foot (some of them by vehicle) and visited each sample school together with the shape, in-depth interview schedule, FDGs opinion, and request letter given by the Department of Mathematics Education, T.U. Kirtipur. After this, the researcher explained the aim of the visit. Then the researcher requested the teacher of the college included within the sample to fill questionnaire honestly. a number of the teachers filled questionnaires and returned in an hour of that day and a few returned in two, three, four, or five days later. The in-depth interview schedule was asked to the chosen sample teacher by using open-ended questions.

This research is qualitative. The study has been supported primary and secondary data sources. Discussion, in-depth interviews, focus group discussion, and collection of data during the research are the first source for the study. Within the same way literature on the theme, researches on an analogous topic further as suggestions by expert's et al too are the secondary source for this study.

Selection of Research Participants

For my research, first I choose different four schools from Sindhupalchok district where there should be the use of ICTs while teaching mathematics. For my research, I have selected five teachers from lower secondary-to-secondary level to participate.

Profile of Research Participants

Teacher 1, (Siva Karki) : He is secondary level mathematics teacher of indreshwori Secondary school in Melamchi municipality of Sindhupalchok district. He started teaching mathematics from7years. Recently he applies ICT in his classroom.

Teacher 2, (Suman Shrestha): He is secondary level mathematics teacher of Janata

secondary school in Melamchi municipality of Sindhupalchok district. He started teaching mathematics from 4 years. In addition, he applies ICT in his classroom from 1 year.

Teacher 3, (Ram Dulal): He is Lower secondary level mathematics teacher of Adarsha secondary school in Melamchi municipality of Sindhupalchok district. He started teaching mathematics from 10 years. In addition, he applies ICT in his classroom from 2 year.

Teacher 4, (Gopal Karki): He is Secondary level mathematics teacher of Jaya bageshwori Secondary school in Melamchi municipality of Sindhupalchok district. He started teaching mathematics from 7 years. In addition, he applies ICT in his classroom from 1 year.

Teacher 5, (Gita Puri): She is Secondary level mathematics teacher of Bal sudhar secondary school, in Melamchi municipality of Sindhupalchok district. She started teaching mathematics from 10 years. In addition, he applies ICT in his classroom from 1 year.

Data Analysis Procedure

An interview schedule and focus word were the most tools of generating information. For the info collection, I have been also discussed with many people of Melamchi community like their leaders, teachers, farmers, professional people, senior adults, and students of this area. Moreover, I visited school area, this study I observed some school and met the mathematics teachers who were practicing using ICTs tool in their mathematics classroom but they are facing many problems like the shortage of data and skill to use the ICT based instruments likewise projector, and mathematical based software. Among them, they are facing such problems on implementing in mathematics classroom, challenges of your time management, challenges on

engagement of learners and adapting unfamiliar technology were the most

important problems encounter by mathematics teachers in implementing ICTs in

mathematics classroom. besides they were got opportunities on student motivation,

increase self independence, best opportunities for jobholder, develop the knowledge

and skill, use of ICTs saves expenditure in learning, opportunities for collaboration,

promote and improve the digital culture in schools. Moreover, it absolutely

was founded through the in-depth interview and focus word from my participants and

student from focus word. Finally, I triangulated the information with theory and

related literature then generate the meaning of this study also try and interlink the

opportunities and challenges using ICTs in mathematics classroom.

CHAPTER IV

ANALYSIS AND INTERPRATION OF DATA

This chapter presented the info collected through in depth-interview with instructor and focused group discussion. This chapter is divided into two section, In first section I have mentioned challenges faced by mathematics teacher in implementing ICTs and within the section, I've got mentioned the opportunities obtained by math teacher while teaching mathematics through using ICTs in mathematics classroom. The brief discussion of those sections was presented below.

Section I: Problems Encounter by Teachers in Implementing ICTs in Mathematics Classroom

After collecting data, I collected data through qualitative research method. During this chapter, I deal with my answer of inquiries to achieve the objectives constructing to chapters. In section – I dealt major problems encounter by teachers in implementing ICTs in Mathematics classroom and section – II, I explore the opportunities obtained by math teacher using ICTs in mathematics classroom.

Problems encounter by teachers in implementing ICTs in mathematics classroom is that the major problem so I began to achieve the an objective I took the interview with the math teacher.

Lack of Training in Implement in ICT in Mathematics Classroom

Information and communication technology (ICT) in education refers to teaching and learning of subject matter that enables the functions and effective use of information and communication technologies. ICT has changed many aspects of our

lives. The impact of ICT has been enormous in educational activities too. When we look at education, there seems to have been an influence and far less change than other fields. There are many attempts to explore possibilities and opportunities. Various factors are impeding the wholesale uptake of ICT in education across all sectors.

In this line, one of my mathematics teacher participants shared Mr. Suman Shresta's view who was the teacher of Janata secondary school.

"We taught mathematics without training in information and communication technology, actually we heard that it is easy to teach mathematics by using ICT tool but we are anonymous about it. We had not too chance to enroll in ICT-based training and practice in mathematics workshops even organized training by the school. If we were got a chance to participate in ICT training related to mathematics teaching, we would do better in teaching mathematics through ICT tools used."

From the above Information of my participant, I concluded that lack of training to implement ICT in actual mathematics class is the main problem to occur the teacher. In this line, the integration of ICT into the teaching and learning process is complex, expensive, and difficult that has been identified by many researchers. Bingamils, (2009) identified problems and challenges to integrate technology for teaching and learning in the classroom influencing different factors such as school level, teacher level, and system level. However, Al-Faki & Hassan (2014) identified user characteristics, content characteristics, technological considerations, and organizational capacity as major factors that influenced the integration of ICT into classroom teaching in general and mathematics teaching in particular.

Lack of Infrastructures and Technical Supports

Information and Communications Technology (ICT) infrastructure represents

equipment and software necessary to implement and operate systems and networks

for communications services as well as support applications, digital content, and e-

commerce. Teacher's perception of usefulness, ability to innovate, expertise, attitudes,

Technological, Pedagogical, and Content Knowledge (TPACK), level of engagement,

the shift in technological beliefs about teaching and learning, and feelings concerning

ICT are the major important aspects that lack while using ICT in teaching and

learning mathematics (Wachira & Keengwe, 2011). I believe in that only available

hardware, means of program software, and other related tools might not work

themselves that teachers need to be well confident but a problem occurs in the

Nepalese context mathematics teachers have, lack of knowledge of TPACK for the

sound delivery of the contents (Singh & Chan, 2014; Ling Koh, Chai, & Chun, 2013).

According to Becta, (2006) mention that *"If there is lack of available technical*

support in schools, technical maintenance will not be carried out regularly resulting

in a higher risk of technical breakdowns". In this line, one of my mathematics teacher

participants shared Mr. Siva Karki's view who was the teacher of Indreswori

Secondary School.

"There is no free Wi-Fi facility to encounter mathematics related problems

through ICT tools. There is no access to the laptop/computer in the teacher. These

instruments are not provided by the school even teachers have not due to the lack of

knowledge about ICT tools. There is no access of projector in every class due to lack

of projector teachers are not accessible to introduced ICT in the classroom."

From the above Information of my participant, I concluded that lack of

training to implement ICT in actual mathematics class is the main problem to occur

the teacher. From this line; Etambo, Kapkiai, & Daniel, (2016) argued that technical

challenges are one of the top barriers that are influencing mathematics teachers while integrating ICT into the teaching of mathematics. ICT is a basic understanding tool to motivate students and provide some sense of how we can create learning more enjoyable and sustainable. Therefore, ICT gives such opportunities to simplify abstract ideas and promote a good environment.

Lack of Confidence and Competency of Teachers on ICTs, Implementing in Mathematics Classroom

When you lack confidence, you spend more time thinking and worrying about what other people are doing than focusing on your own competence and potential. This focus on others robs you of the positive energy you need to fuel your ambition and reach your objectives. One of the problems that prevent teachers from using ICT in their teaching is lack of confidence and competency. The study investigated the reasons for teachers' lack of confidence and competency with the use of ICT and found that due to, 'fear of failure' many teachers do not consider themselves to be well skilled in using ICT and feel anxious about using ICT in front of a class. In this line one of my mathematics teacher participant, shared Mr. Ram Dual's viewed who was the teacher of Adarsha Secondary School.

"It is difficult to use of computer and secondary devices without lack of knowledge and skills. We are not skill based ICT mathematics teacher. We have the lack of confidence and competency using ICT tools in classroom. We are not trained so lack of confidence and competency is one of the problems while using ICT instruments in classroom."

From the above Information of my teacher participant, I concluded that lack of

training to implement ICT in actual mathematics class that is a main problem to occur the teacher. Current research has shown that the level of this barrier differs from country to country. In the developing countries, research reported that teachers' lack of technological competence is a main barrier to their acceptance and adoption of ICT (Pelgrum, 2001; Al-Oteawi, 2002). According to Balanskat et al. [10] limitations in teachers ICT knowledge makes them feel anxious about using ICT in the classroom and thus do not have confident in using it in their teaching. Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were unenthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices.

Lack of Learning Equipment Tools and Resources

The ICT tools means to digital infrastructures like computers, laptops, printers, scanners, software programs, data projectors, and interactive teaching box, So these are the main ICT learning tools that I suggest to use to aide in the development of literacy and language. There are other tools such as multi-link headphones, digital cameras, webcams, audio recording software, walkie-talkies, telephones that also encourage the development of speaking and listening skills. It was founded that most of the institutions had computers. However, the computers were very few and most of the time they were being used by students who were offering computers science and information technology (IT) leaving the rest of the students and teachers in dilemma. A teacher would have no access to ICT materials because most of these were shared with other teachers.

Teachers identified lack of insufficient numbers of computers, insufficient peripherals, and insufficient numbers of copies of software, and insufficient

simultaneous internet access as the main obstacles to the implementation of ICT in educational institutions. According to Balanskatet,(2010), the accessibility of ICT resources does not guarantee its successful implementation in teaching, and this is not merely because of the lack of ICT infrastructure but also because of other problems such as lack of high quality hardware, suitable educational software, and access to ICT resources.

In this line one of my mathematics teacher participant, shared Mr. Ram Dulal's viewed who was the teacher of Adarsha Secondary School.

"We are limited in one computer and slow internet which was provided by school. Due to such insufficient numbers of computers, insufficient peripherals, and insufficient numbers of copies of software, and insufficient simultaneous internet access as the main obstacles to the implementation ICT in mathematics classroom. We are facing such problems while implementing ICTs in mathematics classroom, these are; insufficient numbers of computers, insufficient peripherals, and insufficient numbers of copies of software, and insufficient simultaneous internet access"

From the above Information of my participant, It was identified that teachers reluctant to use new technology, lack of motivation, lack of finance, delay in processing documents, lack of skilled personnel and of limited time were the mid-level problems. Newhouse (2010), asserts that poor choices of hardware and software and lack of consideration of what is suitable for classroom teaching are problems facing many teachers

Challenges of Time Management

"Time management" refers to the way that you organize and plan how long you spend on specific activities. It may seem counter-intuitive to dedicate

precious time to learning about time management, instead of using it to get on with your work, but the benefits are enormous: Greater productivity and efficiency. The study reveals that many teachers have skills in using computers in the classroom, but they still make little use of technologies because they did not have enough time. A significant number of teachers identified time limitations as one of the difficulties in scheduling enough computer time for classes as a problem in their use of ICT in their teaching and learning. is an important factor affecting the application of new technologies in ICT education. In this line one of my mathematics teacher participant, shared Mr. Siva Karki's viewed who was the teacher of Indreswori Secondary School.

"We haven't any leisure period to give the time in ICT tool implementation. All the time should spent in classroom with books so we have not time to use ICT in school. We need time to locate internet information, prepare lessons, explore and practice using the technology, deal with technical problems, and receive adequate training. One of the biggest issues that affects online teacher is poor time management. Lack of a schedule, too many distractions and multitasking can lead to poor time management. Another factor that may lead to poor time management is the lack of a designated workspace. We had distractions everywhere like internet disconnect, staying motivated, technical issues, some students being left behind, diminished social aspects. Unreliable power supply and too much of power fluctuation also interrupts teaching and it is worse to the students especially when it comes to practical lessons."

From the above Information of my participant, It was identified that the lack of time is an important factor affecting the application of new technologies in ICT

education. Lack of confidence, lack of knowledge; course material and political influence were the lower level problems. Factors related to administrators. Institutions in Nepal are lacking in ICT materials and professional instructors who are literally conversant with the interest in ICT techniques. From this line, According to Becta (2012), the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks. Some of the teachers who participated specifically mentioned that they need time to locate internet information, prepare lessons, explore and practice using the technology, deal with technical problems, and receive adequate training. Recent studies show that lack of time Poor network providers, unreliable and slow internet connectivity make it difficulties to use ICT and hence affect the teaching-learning process. For example- handling programmed like digital Nepal framework 2019, learning which needs constant network stability. It was found that the lack of proper knowledge about the importance of using ICT by administrators was one of other factors that limit the use of ICT. Regarding the ICT integration into teaching-learning process, the respondents gave several opinions.

Psychological Challenge

Educational psychology is the branch of psychology concerned with the scientific study of human learning. The field of educational psychology involves the study of memory, conceptual processes, and individual differences (via cognitive psychology) in conceptualizing new strategies for learning processes in humans. The physiological factors are sense perception, physical health, fatigue time and day of learning, food and drink, age and atmospheric conditions. In this line e - learning is the transfer of precise educational content and potential instructional method via World Wide Web. The purpose is to endorse understanding, capabilities, and skills in young learners to enhance their knowledge both qualitatively and

quantitatively (Rovai, 2004).In this line one of my mathematics teacher participant shared Mr. Suman Shresta's view who was the teacher of Janata secondary school.

"Information and communication technology (ICT) in education refers to teaching and learning of subject matter that permits the functions and effective use of information and communication technologies. ICT has changed many aspects of our lives. The impact of ICT has been enormous in educational activities too. Once we look at education, there seems to possess been an influence and much less change than other fields. There are many attempts to explore possibilities and opportunities. Various factors are impeding the wholesale uptake of ICT in education across all sectors.

From the above Information of my participant, It was identified that the psychological challenge have found during the implementing the ICTs in mathematics classroom. In addition, others an important factor affecting the application of new technologies in ICT education. Lack of confidence, lack of knowledge; course material and political influence were the lower level problems. Factors related to administrators. Institutions in Nepal are lacking in ICT materials and professional instructors who are literally conversant with the interest in ICT techniques

Pedagogical Challenges

Pedagogy, taken as an academic discipline, is the study of how knowledge and skills were imparted in an educational context, and it considers the interactions that take place during learning. Both the theory and practice of pedagogy vary greatly, as they reflect different social, political, and cultural contexts. The teacher's own pedagogical beliefs and values play an important part in shaping technology-mediated learning opportunities. It is not yet clear from the research literature whether this

results in technology being used as a 'servant' to reinforce existing teaching approaches, or as a 'partner' to change the way teachers and pupils interact with each other and with the tasks. Teachers need extensive knowledge of ICT to be able to select the most appropriate resources. They also need to understand how to incorporate the use of ICT into their lessons; they may need to develop new pedagogies to achieve this. Introducing technology alone will not change the teaching and learning process,

The existence of ICTs does not transform teacher practices in and of itself. However, ICTs can enable teachers to transform their teacher practices, given a set of enabling conditions. Teachers' pedagogical practices and reasoning influence their uses of ICT and the nature of teacher ICT use affects student achievement. Studies show that the most effective uses of ICT are those in which the teacher and the software can challenge pupils' understanding and thinking, either through whole-class discussions using an interactive whiteboard or through individual or paired work on a computer. If the teacher has the skills to organize and stimulate the ICTs-based activity, then both whole-class and individual work can be equally effective. An effective pedagogical practice with ICT This literature review has identified a range of practices, which should be part of teachers' pedagogical frameworks if they are to integrate ICT effectively into teaching, learning, and the curriculum. In this line, one of my mathematics teacher participants shared Mr. Gopal Karki's view who was the teacher of Jaya Bageshwori Secondary school.

"We are not practiced in a new pedagogical method for teaching mathematics while implementing ICTs in the classroom. We faced such pedagogical challenges as passive students; online instruction can turn students into passive observers rather than active participants. Although these unengaged students may acquire the lecture

content, they are not able to apply their learning outside the virtual classroom. Instructional strategy; n online learning environments, it is important to help students engage with course material in a way that makes sense for them. Providing them with ample flexible opportunities to reinforce course concepts will ensure that learning material sticks with them, even after they have completed their final assessment. Staying connected with students; in an online classroom, much of the learning was completed asynchronously and students often feel disconnected from their instructor, as well as their peers. It can be difficult for instructors to teach online when they struggle to gauge how students comprehend course content, and whether they are participating in learning experiences. Encouraging collaboration; Collaborative engagement motivates learning and promotes a deeper and more critically aware approach to the subject matter. Unfortunately, collaboration is one of the most difficult things to achieve when students are not physically present together."

From the above Information of my participant, it was identified that pedagogical challenge is an important factor affecting the application of new technologies mathematics classroom implementing ICTs education. These include the need for teachers to understand the relationship between a range of ICT resources and the concepts, processes, and skills in their subject use their subject expertise to select appropriate ICT resources which will help them meet the specific learning objectives; this includes subject-specific software as well as more generic resources be aware of the potential of ICT resources both in terms of their contribution to pupils' presentation skills, and their role in challenging pupils' thinking and extending their learning in a subject develop confidence in using a range of ICT resources, via frequent practice and use beyond one or two familiar applications appreciate that some uses of ICT will change how knowledge is represented, and the way the subject

is presented to and engages pupils to know how to prepare and plan lessons where ICT is used in ways which will challenge pupils' understanding and promote greater thinking and reflection.

Lack of Internet Connection in Schools

An intranet is a computer network for sharing information, collaboration tools, operational systems, and other computing services within an organization, usually to the exclusion of access by outsiders. A high-speed Internet connection provided by broadband technology does not only have a significant effect on reducing the class time allocated by students searching for information on the Internet but also provides them with more chances of synergy for knowledge construction by facilitating browsing, scanning, searching. From this line, While it may seem like almost everyone has internet access, a shocking number of families lack fast or reliable internet connections. There are roughly Less than 20% of Nepal's Population with school-age children who don't have broadband internet access at home. That means millions of students are being left behind the school. In this line one of my mathematics teacher participant shared Mr. Gopal Karki's view who was the teacher of Jaya Bageshwori Secondary school.

"There are many ways that a lack of internet access can affect a teacher's academic performance. Teachers without internet cannot connect with students or classmates, do independent research, or get online homework help. For families, not having internet access can mean missing information or missing a direct line of communication with schools and teachers. There are some major drawbacks, which we faced lack of internet in implementing ICTs in mathematics to e -learning, and these problems often get pushed aside in online discussions. e-learning requires strong self-motivation and time management skills, lack of communication skill

development in online student. cheating prevention during online assessments is

complicated."

From the above information of my participant, it was identified that the Lack of internet access is an important factor affecting the using ICTs in mathematics classroom. Lack of internet is one of the biggest problems faced by students without internet access at home is their inability to complete homework. Homework has long been a source of hot debate within the education community and vice-versa.

Challenges on Engagement of Learners

Learning engagement is the ability to motivationally and behaviorally engage in an effective learning process. Engagement was driven through interaction. In other words: "education with participation" If your students are going to remain engaged – especially in a remote online setting – they need to participate. Let us look at how the quality of online education is currently perceived in comparison with in-person classes. Learner engagement is a measure that reflects the quantity and quality of a learner's participation in their courses and every other aspect of their educational program. In addition, it echoes a learner's interaction and cooperation with co-learners and instructors. In other words, learner engagement is the measure of a potentially successful learning experience for everyone concerned. In addition to affecting readiness to learn, research has found that problems in classroom engagement are associated with negative academic achievement and behavioral outcomes, such as truancy and suspension (Fredricks, Blumenfeld, & Paris, 2004). In this line one of my mathematics teacher participant shared Mrs. Gita Pur's view who was the teacher of Bal sudhar secondary school.

"We can engage learners from global scenario but the problems related to engagement of learners are not in small scale. Students are not engaging in virtual

learning, students' life circumstances have changed. Stress and trauma can interrupt

cognitive processing, reduce teachers' executive functioning skills, and

disrupt emotional regulation. Successful online student engagement was influenced by

a number of psychosocial factors such as peer community, an

engaging online teacher, and confidence or self-efficacy and by

structural factors such as life load and course design."

From the above Information of my participant, It was identified that the challenges on engagement of learners is an important factor affecting the using ICTs in mathematics classroom. From this line, live video classes may pose unique challenges for students who learn and think differently. Students who have difficulty with focus and distractibility, trouble managing sensory input or increased anxiety about being "on display" may behave in ways that challenge your definition of engagement. Behaviors like fidgeting, turning off the camera, or moving around during class meetings can look like a lack of engagement.

Adapting Unfamiliar Technology

Technology is the sum of techniques, skills, methods, and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation. His main argument for technology in the classroom is that emerging students should be able to apply classroom concepts to daily life, and a large part of daily life revolves around technology. Students today are apt at using technology, and tools such as laptops, smart phones, and tablets are already second nature to them. Taking technology out of the learning equation would be removing an integral part of the students' abilities. Likewise, even if the student was not already technology-savvy, that was even more of a reason to embrace the skill. Understanding

technology is becoming more and more important in the workplace and other areas; competing with peers in the 21st-century simply necessitates the need for technological finesse. However, digital innovations can be a source of challenges for schools as well. In this line one of my mathematics teacher participant shared Mrs. Gita Pur's view who was the teacher of Bal sudhar secondary school.

"We are not able to familiar with new technology due to the lack of proper training and knowledge; technologies are being complex day to day. We hadn't practice about the technologies before so we are in trouble due to unfamiliar technology which is related to online learning, mistake and error occurred when we went to learning platforms, that's make us very upset and feel likes, illiterate for new technologies and innovation. Such problems faced by myself during implementing ICTs in classroom are; pace of change & cost, different social dynamics, perceived effectiveness of technology, lack of alignment between technology, curriculum, and instruction, lack of clarity about the purpose of 'school; that has fully implemented technology in the classroom."

From the above Information of my participant, it was identified that the adapting unfamiliar technology is an important factor affecting the using ICTs in mathematics classroom. From this line, this is something that I have had to focus on, and I feel I've gotten better at as the students progressed. The hardest part for him was the lack of interaction and engagement from students without the face-to-face connection. Students can become extremely passive with online lectures, so I tried to develop problems that we worked in class. Lecturing to a sea of digital faces on Zoom

offered little feedback for instructors, and students reported feeling isolated and de-motivated.

Section -II: Opportunities Obtained by Mathematics Teacher Using ICTs in Mathematics Classroom

To achieve this objective I took the interview with the different mathematics teachers

Student Motivation

Student motivation naturally has to do with students' desire to participate in the learning process. However, it also concerns the reasons or goals that underlie their involvement or noninvolvement in academic activities. Online learning was considered one of the best opportunities nowadays for professional grooming and learning and thus the number is increasing in every country. Study conducted on teacher's shows positive impact of online learning as it is suitable for work condition and needs. In this line, It was recommended to provide online learning opportunity to teachers despite of their age, working experience and area of residency. (Karaman, 2011). Study conducted on learners from higher studies show association between eLearning and learners motivation. To motivate students online, provide opportunities for students to personally connect to the subject matter; have students set their own goals; set up a system for self-monitoring and progress-tracking; encourage students to collaborate with you on the syllabus or course reading material; and act as the facilitator. In this line one of my mathematics teacher participant shared Mrs. Gita Pur's view who was the teacher of Bal sudhar secondary school.

"When I was teaching through online, students were very upset at the first time. But i able to encourage them attend the class fearlessly and carefully. I used

such way to improve student's motivation through online learning. I gave to them timely and sensitive feedback. Feedback is critical in online learning, provide easy access to resources. Use a variety of instructional methods, the tutor's enthusiasm, good planning, and organization. Provide concrete and clear examples; improve student autonomy by the help meditation. I encourage students and teach them responsibility is to get them involved in the classroom. Made participating fun by giving each student a job to do. I gave students the responsibility of searching different videos on YouTube and act as in activities related to videos. I made a students work in groups and assign each a task or role. To make a slide with fun picture and to evolve in learning process"

From the above Information of my participant, it was identified that the student's motivation was an important factor that the teachers get opportunities in online class in mathematics classroom. From this line, a teacher must be motivated at doing his work in order to bring quality and development in the educational aspect. Their demonization directly affects the productivity decrease at working with students causing a decrease even in the academically development.

Increase Self Independence

Confidence means feeling sure of yourself and your abilities-not in an arrogant way, but in a realistic, secure way. Confidence is not about feeling superior to others. It was a quiet inner knowledge that you're capable. Feel secure rather than insecure. Self-confidence is an attitude about your skills and abilities. It means you accept and trust yourself and have a sense of control in your life. For instance, you can feel very confident in some areas, such as academics, but lack confidence in others, like relationships.

In this line one of my mathematics teacher participant shared Mrs. Gita Pur's view who was the teacher of Bal sudhar secondary school.

"I always prepared and plan that made me to present nicely in online classroom. I had chance to be conscious of my body language that made me a perfect teacher fir online teaching. I was in accurate to present in online class due to the using ICTs in mathematics classroom. I realized my strengths during online class; I was so weak to take confidence in physical class. Walk tall is the means of building of self-confident, which I practiced. I increased communication skills through online class by the help of different kinds of students who motivate me as a good content presenter. I had to chance setting goals for the online teaching, which increased my self-confidence during online class. Gain new students who helped me increase my self-confidence. I had a chance to increase positive energy, as an online teacher, you need to be positive, otherwise, your students are unlikely to enjoy their lessons."

From the above Information of my participant, It was identified that the Increase self- confidence is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom. You can read the books, specific blogs, watch the tutorials, use the apps related to the topic and you can gain practical knowledge.

Technology gives you instant information: As an independent learner, you must be up to date with the concept you are learning, otherwise you are not able to stand in the cut through competition. Social media will give you instant information about the topic you are searching for. You can get the latest updates through twitter, Facebook LinkedIn so we should follow the social networks for proper knowledge.

Best Opportunities for Jobholder

An online job is any job where you can work from home or a remote location, rather than reporting to a set location daily. Online jobs are becoming more and more readily available as technology and internet connections continue to improve. Many people work online in a variety of fields such as customer service, writing, billing, computer programming, and education. An online job fair, also known as a virtual job fair or electronic job fair, is an online version of a traditional job fair. Like a traditional job fair, online job fairs are live, fully interactive, and held at specific times. Several companies offer online job fairs. As per UNESCO, Information and Communication Technology (ICT) refers to a diverse set of technological tools and resources used to create, store, transmit, Share or exchange information. These technological tools include computers, the internet, live broadcasting (radio, television, and webcasting), recorded broadcasting technologies, and telephony. In this line one of my mathematics teacher participant shared Mr. Gopal Karki's view who was the teacher of Jaya Bageshwori Secondary school.

"If you know about the online using tools, you should have the knowledge about ICTs tool so I had got such opportunities from online. It would be better for the new people who want to learn and earn online using the ICTs tool. This will be the best opportunities for job holders if we know then we can earn doing such work online; part-time blogging, online surveys, affiliate marketing, online tutoring, content writer, data entry or form filling, get paid to play games, become a part-time seller, online consultant, part-time photography, you tube partnership, digital marketing services, social media manager, virtual assistant, mystery shopper, online ICT instructor, online media editor, offline data entry. We got many jobs just mentioned above if we know ICT tools and many more."

From the above Information of my participant, It was identified that the Increase Best opportunities of job holders is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom. The year 2020 turned out to be ICT dominated year in which students at different stages made use of ICT tools for learning. Smart phones were used as an ICT tool for teaching learning by using different media and teaching through zoom App has been the popular way here. The year 2020 made particularly the classroom teaching impracticable and paved way for online teaching. The use of ICT became more and more relevant and pronounced. The teachers and students had no other option but to shift to on line mode of teaching learning. The Information and Communication Technology (ICT) has revolutionaries all the spheres including teaching learning. The role of ICT became more and more prominent and was the only reliable means of imparting education during the pandemic.

Develop the Knowledge and Skill

Information and communication technologies were currently being used in education to assist students to learn more effectively by providing teachers with access to a wide range of new pedagogy. These technologies are also being used to enable teachers to do administrative tasks more efficiently. It is very important to utilize and manage the increasing volume of information effectively and securely. This is the reason why ICT skills are essential and should form a major part of an organizations strategy in providing better quality data management and information utilization. Information and Communications Technology (ICT) can affect student learning when teachers are digitally literate and understand how to integrate it into curriculum. Schools use a diverse set of ICT tools to

communicate, create, disseminate, store, and manage information. . In this line one of my mathematics teacher participant shared Mr. Gopal Karki's view who was the teacher of Jaya Bageshwori Secondary school.

"When I was using online teaching I have learnt many skill and knowledge through implementing ICTs tool. I was quit afraid about the online teaching problems which faced by mathematics teachers but I have got the many opportunities to enhance it such practice which I have get from its develop a time management strategy, make the most of online discussions, use it or lose it. Make questions useful to your learning, stay motivated, communicate the instruction, techniques that work, make connections with fellow students. We can acquire the knowledge and skills through online, YouTube, different websites which provides the actual knowledge about related field. I had learned many more techniques to tackle the problems rose in using ICTs tool while teaching through online class. So it was the opportunities using ICTs tools in mathematics classroom while online teaching"

From the above Information of my participant, It was identified that the develop the knowledge and skill is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom. ICT skills are an essential requirement for the majority of job roles. Having these skills will help you to organize your workload, streamline processes and access digital information. When applying for jobs, improving your ICT skills is a sensible way to give you a competitive advantage over other candidates.

The ability to use computer operating systems, to access software programmers manages the basic functions of a computer. Being able confident use

core computer programmers to produce common digital information such as word documents and power point presentations.

Use of ICTs Saves Expenditure in Learning

Online education alleviates housing costs by letting students take advantage of their current living situation, thereby saving thousands of dollars each semester. Textbooks are another expensive reality of traditional college education that online education alleviates. A few ways in which e learning saves time: With eLearning, learners get to learn at their own pace, rather than moving with the pace of the classroom. So quick learners aren't help back by the group. With eLearning, there is no travel involved, to and from the training venue. Not only do colleges save money by offering online degrees, students can save money by enrolling in these programs. Studying online can lower your total costs because the net tuition per student tends to be lower. Associated costs for books, supplies, board, and transportation are usually less expensive as well. In this line one of my mathematics teacher participant shared Mr. Gopal Karki's view who was the teacher of Jaya Bageshwori Secondary school

"Many of school collage and universities are offering the degree and classes in half of fee nowadays through attempting online classes. The cost of online education vs. traditional education is less cost-efficient. If you applied for online class, they offered you less then less cost fee for your degree. While the cost of a college degree can seem overwhelming, savvy students can, with a bit of research, find an affordable option that fits within their budget in addition to meeting their academic needs - whether they ultimately choose to pursue an affordable online college, or find ways to reduce the cost of a traditional, campus-based education. So uses of online attempting learning that's give us cost-effective education, that's why

this is the opportunities whose who have the knowledge of ICTs based tool and others

peripherals."

From the above Information of my participant, It was identified that the Use of

ICTs save Expenditure in learning is an important factor that the teachers get

opportunities in implementing ICTs in mathematics classroom.

By streamlining your business and technology processes, you can significantly

reduce employee hours: thus producing substantial cost savings. Another area that

owes a great deal to new technology, and which can save you thousands of

dollars, is 'remote working' or working from home. Cloud technologies can also be

used to reduce IT costs. Our innovative cloud solutions include Collocation, virtual

private servers, and file back up and sharing. ICT can help reduce training and

development costs for your team. Information can be shared, stored, and distributed

online.

Opportunities for Collaboration

"Deeper Learning: A Collaborative Classroom Is Key"

Online collaboration offers organizations a chance to achieve optimal communication

among team members during projects. Members of a team can bounce ideas off one

another from mobile locations as well. This keeps everyone on a project connected

and builds efficiency.

The purpose of the ICT collaboration is to build research relationships,

networks through shared training and technological, and product development

agendas. Collaborative learning encourages and enables students to work

and learn together to study and explore a subject, to solve a problem, to complete a

task or an assignment, or to create a project. Using ICT to support

such collaborative work has a number of advantages. There are many benefits to

using ICT to teach literacy. ICT allows the teacher to produce and modify resources quickly and easily. It allowed access to a wide range of information in various formats, and interactive whiteboards (IWBs) have become essential tools in the classroom. In this line one of my mathematics teacher participant shared Mr. Suman Shresta's view who was the teacher of Janata secondary school.

"Collaborative learning is best learning through online. I have learnt many skills from the collaborative methods through online from various experts and teachers who are highly recommended for knowledge share. from those I have get such collaborative knowledge; development of higher-level thinking, oral communication, self-management, and leadership skills, promotion of student-faculty interaction, increase in student retention, self-esteem, and responsibility, exposure to and an increase in understanding of diverse perspectives, preparation for real life social and employment situations. it helps us problem-solve, collaboration brings people (and organizations) closer together, collaboration helps people learn from each other, it opens up new channels for communication, collaboration boosts morale across your organization, it leads to higher retention rates, collaboration makes us more efficient workers."

From the above Information of my participant, it was identified that the collaborative learning is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom. From this line, collaborative learning can occur peer-to-peer or in larger groups. Peer learning, or peer instruction, is a type of collaborative learning that involves students working in pairs or small groups to discuss concepts or find solutions to problems. Similar to the idea that two or three heads are better than one, educational researchers have found that through peer

instruction, students teach each other by addressing misunderstandings and clarifying misconceptions. For more on peer learning

Promote and Improve the Digital Culture in Schools

A digital culture is a concept that describes how technology and the internet are shaping the way that we interact as humans. It is the way that we behave, think, and communicate within society. A digital culture was the product of the endless persuasive technology around us and the result of disruptive technological innovation. It is applicable to multiple topics but it comes down to one overarching theme; the relationship between humans and technology.

Cultural change is surely the key to a successful transformation, so is investing efforts in cultivating a digital mindset. Developing a digital culture is a time-consuming process but is the need of the hour. Employees want to work in an environment where they can play around with new ideas, collaborate, and grow. Any change that you want to implement in an organization should be do top-down. Start by building a digital mindset among the management so it passes on to their respective teams. To secure a competitive edge, companies need to shape and embed a digital culture and invest in long-term, sustainable performance. In this line one of my mathematics teacher participant shared Mr. Suman Shresta's view who was the teacher of Janata secondary school.

"Promote and improve the digital culture in schools is very difficult to apply but the continuous improvements, but we obviously meet the goals. Implementing ICTs tool in school and teaching classroom has many opportunities. If we grape this it will be fruitful for us. I have learnt to run different kinds of software, which helps me directly to establish a website through the help of using ICTs. It promote to provide Wi-Fi for the students and teachers, I created students-teachers friendly

environments for online learning. In addition, I created an online-based e-library. Teachers and students can read with their interest e-book through digital device. So finally we helped to create digital school through online teaching and learning environments."

From the above Information of my participant, It was identified that the Promote and improve the digital culture in schools is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom and using ICTs tool.

Independent Learning Platforms for Teachers

A learning platform is a framework of tools that work seamlessly together to deliver a student centric learning experience by unifying educational theory & practice, technology and content. A learning platform is an integrated set of interactive online services that provide teachers, learners, parents, and others involved in education with information, tools and resources to support and enhance educational delivery and management. E- Learning helps teachers by introducing, supporting, or reviewing material that the teacher is covering. Technology is an interesting and exciting way to deliver curriculum. We believe blending e learning into lesson plans and courses helps both teachers and students. By encouraging learners to believe they can do an activity, they also develop learner independence. This 'can-do' attitude in learners helps them feel that it is safe to try new things. When students exchange ideas and insights, they work through misunderstandings, absorb content more effectively, and help each other achieve true understanding. In the online learning also provides students to have independent learning. In this line one of my mathematics teacher participant shared Mr. Siva Karki's view who was the teacher of Indraswori secondary school.

"If we have the knowledge and skills of information and communication technology and their peripheral devices then we can easily access the independent learning platforms with the help of internet. We can learn everything related to any subject matter through different online websites and curriculum resources centers. The benefits of independent learning for students and teachers are awareness of their limitations and their ability to manage them; enabling teachers to provide differentiated tasks for students; and fostering social inclusion by countering alienation. So it is the most important opportunities for teachers who are implementing ICTs in mathematics classroom."

From the above Information of my participant, It was identified that the independent learning platforms for teachers is an important factor that the teachers get opportunities in implementing ICTs in mathematics classroom and using ICTs tool. The study found out that a teacher centered approach, lack of using authentic materials, lack of learning goals, lack of confidence, high dependence on teachers, lack of practice in self-assessment and peer assessment, lack of interest and lack of learning strategies were identified as major challenges using the independent platform for teachers.

Part of a number of other educational concepts and wider policy agenda of contemporary relevance such as 'personalized learning ' student-centered learning' and 'ownership "of learning. It has been seen as one of the essential elements of 'personalized learning. IT technology is very useful for nowadays society, creating many new opportunities in different fields of activity, but when the limits are crossed and the population does not control anymore these gadgets there, is a problem, and can have serious consequences among the healthy development of the human.

Focus Group Discussion

A focus group is a group interview involving a small number of demographically similar people. Their reactions to specific researcher-posed questions are studied. Focus groups are used in market research and studies of people's political views. The discussions can be guided or open. They can concern a new product or something else. The idea is for the researcher to learn about the participants' reactions. Thus, focus groups constitute a research method that researchers organize for collecting qualitative data, through interactive and directed discussions. Moreover dealing with, problems encounter by teachers in implementing ICTs in Mathematics classroom. For this, I conducted one focus group discussion attending five students. From this F.D.G. I founded that lack of training in implement in ICT in mathematics classroom, lack of infrastructures and technical supports, lack of confidence and competency of teachers on ICTs, Implementing in mathematics classroom and lack of learning equipment tools and resources. Likewise, I conducted one focus group discussion to find the opportunities obtained by mathematics teacher using ICTs in mathematics classroom form the F.D.G. I found that, student motivation, increase self-independence, best opportunities for jobholder, and develop the knowledge and skills.

CHAPTER-V

FINDING, CONCLUSION AND IMPLICATION

This chapter is discussed in deriving some findings and conclusionsfrom the discussion if the previous chapter. Besides findings and conclusions, it has some recommendations, which might be useful for further studies and academic implications.

Findings of the Study

Mathematics is that the most useful subject in existence. So it was absolutely taught at everylevel of our formal education. However, most if the teachers should fails during this subject. It is due to the issues which faced by mathematics teachers in implementing ICTs in mathematics classroom. lack of coaching in implement in ICTs in mathematics classroom, lack of infrastructures and technical supports, lack of confidence and competency of teachers on ICTs, implementing in mathematics classroom, lack of learning equipment tools and resources, challenges of our time management, psychological challenge, pedagogical challenges, lack of internet connection in schools, challenges on engagement of learners and adapting unfamiliar technology. Likewise, the opportunities obtained by mathematics teachers using ICTs within the mathematics classroom, are student motivation, Increase self-independence, best opportunities of jobholders, develop the knowledge and skill, use of ICTs save expenditure in learning, opportunities for collaboration, promote and improve the digital culture in schools, web-based LMS tools connect students, educators, scholars and researchers. The bulk of the teachers face such problems while implementing ICTs in mathematics classroom. Using ICT as a tool, students spend productive time developing strategies for solving complex problems

and develop a deep understanding of the varied mathematics topics. Students can use ICT as a tool to perform calculations, draw graphs, and help solve problems based on ICT-based mathematics problems.

ICT integration in mathematics education provides mathematics teachers with integrative teaching methods that motivate students learning, support their independent learning and active participation within the discovery of mathematics concepts and topics, and, as a result, helps them have deeper understanding of the integration of ICT in education. It will assist teachers with facilitating change from conventional teaching-learning process to a technology-based approach.

Conclusions

The aim of this research was to supply information of finding on the issues encounter by teachers in implementing ICTs in Mathematics classroom. Additionally, the opportunities obtained by math teacher using ICTs in mathematics classroom. Likewise, lack of training in implement in ICT in mathematics classroom, lack of infrastructures and technical supports, lack of confidence and competency of teachers on ICTs, implementing in mathematics classroom, challenges of time management, challenges on engagement of learners and adapting unfamiliar technology were the major problems encounter by mathematics teachers in implementing ICTs in mathematics classroom. similarly, student motivation, increase self independence, best opportunities for jobholder, develop the knowledge and skill, use of ICTs saves expenditure in learning, opportunities for collaboration, promote and improve the digital culture in schools, were the opportunities obtained by math teacher using ICTs in mathematics. This study indicates that teachers have a powerful desire for the mixing of ICT into education but they encountered many barriers there to. These findings therefore have implications for training the teachers to become regular users

of ICT that specialize in acquiring basic IT skills. Since confidence, competence and accessibility were found to be critical components for technology integration in institutions, ICT resources including software and hardware, effective professional development, sufficient time, proper training, and technical support have to be provided to teachers. No component in itself is sufficient to supply good teaching. However, the presence of all components increases the probability of fantastic integration of ICT in teaching-learning process. Therefore, the training of teachers with in the pedagogical issues should increase if teachers are to be convinced of the value of using ICT in their teaching-learning process. They need to be prepared before joining the teaching profession. Where training is absent, teachers can prepare themselves by enrolling in private sessions or by self-training. They ought to open minded towards new approaches of teaching. Where support is lacking, they have to search out ways to be ready to solve problems involving their use of ICT in institutions. Finally, teachers should acquire skills of self-organization, which is able to help them an excellent deal in conducting their classes when using ICT.

Implications of the Study

ICT has transformed teaching and learning processes from being highly teacher-dominated to student- centered, which this transformation will end in in increased learning gains for college students, creating and with opportunities for learners to develop their creativity, problem-solving abilities, and knowledge.

Implication for Teachers

Focuses on enabling student-learning teachers deliberately prepare, manage, and answer to students' responses. This ensures that teachers can profit of opportunities in lesson to consolidate students' understanding for using ICTs tool in mathematics classroom.

Implication for College Students

ICT enables the employment innovative educational resources and the renewal of learning methods, establishing a more active collaboration of scholars and therefore the simultaneous acquisition of technological knowledge. Furthermore, ICTs are of great help in developing discernment.

Implication for Policy Maker

The expansion, diversification, and effective application of ICT will establish a transparent, responsive, and accountable government; develop skilled human resources; enhance social equity; ensure cost-effective delivery of services through public-private partnerships and supply enhanced opportunities for education. It helps to policy makers for better underrating about the new technologies using classroom.

Implication for Curriculum Designer

Applying ICT as a tool for teach in curriculum areas enables all students to own the chance to become competent, discriminating, creative, and productive users of ICT. This is often because ICT could be a means to assist achieving future curriculum goals by providing a learner-centered environment, as studies have shown

Implication for Researcher

ICT can provide access to a large range of resources that are of top quality and relevant to scientific learning. ICT also allows teachers with different teaching styles to change materials and the way they were utilized in different and effective ways. ICT can improve the quality of data available to students. Additionally, implication for who is interest within the field of teaching through ICTs use.

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Appendix – I

Interview schedule for participant teacher's problems encountered by mathematics teachers using ICTs in mathematics classroom.

Name: ... …………………………

Age: ..... ………………………………Sex ……………….Address:

……………………

Research Questions

1. What are the problems faced by teachers using ICTs in mathematics classroom?

 2. What are the biggest challenges facing online education?

3. What are the barriers of ICT using in mathematics classroom?

4. What are the weak points of teacher in using technology?

Appendix – II

Interview schedule for participant teachers obtain opportunities using ICTs in mathematics classroom.

Name: ... ……………………………

Age: ....……………………………………Sex: ………………….Address:

……………………

Research Questions

1. What are the opportunities to the teachers during online lectures?

 2. How do teachers benefit from online learning?

3. What the teacher does to support the learning of learners?

4. What are the weak points of teacher in using technology?

5. What is the focus of online mathematics learning?