

EXPLORING THE USES OF ICT IN GOVERNMENT SCHOOLS OF  
NEPAL

*A Case Study of Pokhara Metropolitan City, Nepal*



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Master's thesis in International Education and Development

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2021

## ABSTRACT

As a developing nation, Nepal has acquired a substantial change in financial divisions during the last decade. The craving to be a middle-income nation has driven Nepal to develop a modern approach in education policies that will assist them with producing a skilled workforce and making teaching and learning meaningful. ICT integration in the education system was the most significant step of this most current education strategy. The Government of Nepal has ventured up to make a fruitful usage of ICT in education. The most powerful methods are for spreading information, knowledge, and skills.

This study researched the technique of innovation incorporation in the education system as indicated by the new education approach of Nepal. It looks at the extent of ICT use in the classroom, the apparent effect of innovations in education with teaching and learning, and the potential factors that appear to hamper enhanced ICT use in education. Information was gathered from teachers and students by utilizing the method of interviews. Direct and indirect observations of the classrooms likewise led to acquiring to bring more credibility in data and have more meaningful validity information. The different theories used to analyze and interpret mainly from Zone of Proximal Development by Vygotsky relating to the social constructivism theory and others.

Schools begin utilizing innovations in their teaching and learning, but the use isn't ideal primarily since a minor infrastructure and stakeholders' perceptions. ICT made a difference to form the classes student-centered and interactive, which was one of the aims of the new education policy. However, the practice of utilizing innovation in teaching and learning is still constrained in most schools with also highlighting the challenges confronting in use of ICT in government schools of Nepal.

Despite this, all the education system stakeholders get the benefits of ICT inclusion, and they are confronting different issues within the implementation process. However, more time is required to overcome these impediments and bring almost behavioral changes among the teachers and pupils to the successful integration of ICT within the education framework of Nepal.

**Keywords:** ICT, education, government school, infrastructure, social constructivism theory, teaching and learning.

## ACKNOWLEDGEMENT

The opportunity to deliver my thesis is an honor for me to my supervisor, Professor Dr. Ellen Carm, senior researcher of Oslo Metropolitan University (Oslo Met), for her supervision and coordination in this fundamental research. I am grateful for her competence, which enabled me to complete my thesis from conception to implementation to its current form.

There is no imagination without family. My parents deserve a particular mention for their unwavering support and prayers. Both mothers Bishnu Mati Tiwari and Dhankali Tiwari who sincerely raised me with their caring and gentle love.

I am thankful for my life partner Mrs. Pratima Neupane for her full support and encouragement, and my daughter Sharvani adding joy to my work. Finally, I owe great gratitude to thank my brothers Keshab Prasad Tiwari & Sagar Prasad Tiwari for their timely support of my research.

I entirely like to dedicate this work to my father late. Mr. Gyan Prasad Tiwari put my fundament in my learning character, showing me the joy of being human. I wish his soul is resting in heavenly peace.

Finally, I would like to thank everyone who contributed to the success of my thesis and forgive me for not having the time to thank every one of you personally.

## ABBREVIATIONS

ICT	Information Communication Technology
DOE	Department of Education
MOE	Ministry of Education
NCED	National Centre for Educational Development
NTA	Nepal Telecommunication Authority
OLPC	One Laptop per Child
REDS	Regional Education Directorates
UNESCO	United Nations Educational, Scientific and Cultural Organization.
CBS	Central Bureau of Statistics
GON	Government of Nepal
GDP	Gross Domestic Product
HDI	Human Development Index
UNDP	United Nations Development Programme
MDG	Millennium Development Goals
WSIS	World Summit on the Information Society
CLA	Central Level Agency

RC	Resource Centers
BPEP	Basic and Primary Education Program
SMC	School Management Committee
DEO	District Educational Officer
DEC	District Education Committee
SLC	School Leaving Certificate
EFA	Education for All
NER	Net Education Rate
GPI	Gender Parity Index
STRO	School Teacher Record Office
PPP	Public Private Partnership
NIT	National Information and Technology
TYIP	Three Years Interim Plan
SSRP	School Sector Reform Plan
OLE	Open Learning Exchange
NWNP	Nepal Wireless Networking Project
ZPD	Zone of Proximal Development

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# CHAPTER I: INTRODUCTION

## 1.1 Background

The technical advancements in Information and communication technology admired as the central component in education (Ferrari, 2012; UNESCO, 2011) have impacted societies worldwide with steady growth over the last few years. Educational agencies all over the world have certainly done their best to adapt. Thus, it is associated with the whole world influencing the socio-economic sectors.

In this new era of technology, ICT is the new concept in Nepal where; these might be implemented in private schools, but the students hardly know about the ICT in governmental schools. They even do not have electricity and internet access in public schools in rural areas. For this research, I want to explore the use of ICT in schools, how ICT education works to make it more digitalized in the teaching sectors regarding the subjects they must study. How the paper learning curriculum will impact the students compared to the multimedia settings will be inspected upon. Information and communication technology (ICT) and development are widely recognized as vehicles for a nation's economic growth (Ukpe, 2016). Also, established the importance of ICT infrastructure and its potential for fostering development. It also underpins one of human beings ' fundamental rights, namely seeking, gaining, and obtaining information. Digital literacy in teaching in schools helps students to acquire the knowledge, skills and develop more ideas about the contexts with better understanding.

Regarding the uses of ICT, it is very minimal that students know and even teachers and its good benefits in the teaching and learning process. The ICT implementation in the education system in Nepal identifies and inspects the system that impacts the formal education system. Generally, ICT can be in different forms with the characteristics of technology that covers the medium of sound, image, text, videos that people think and refer to as technology, for example, mobile phones, cameras, etc. With the help of technology, people benefitted from encompasses using mobile phones, computers with which related products such as email, messages, and other forms of communication are possible. Along with these services, people don't need to see the uses of ICT and their conditions of use. People are using different modes of ICTs as TV, computer, mobile phones, etc. but their main issue is to connect to their lives and dreams.

The people are reaching the level of increased consuming level and changing about the social structure of the society and the acquiring the information. ICT impacts human life by transforming the socio-environment settings dominating the technology. With this aspect, it became the part of human lives that will be with human environments. ICT in education also known as e-learning is the approaches like one-to-many, one-to-one, one-to-alone, or self in communicating and learning process. The valuable roles for ICT and the technology to support effective pedagogy, as mentioned by Jonassen (1999) as (Pvt.Ltd., 2016)) as the tool that helps the knowledge buildup and also to the learning by construction as a context to support learning by doing, as a social medium to support learning by conversing, as an intellectual partner to support learning by reflecting, and as information vehicle for exploring knowledge.

## **1.2 Statement of the problem**

The science, technology, and innovation have become key factors contributing to economic growth in advanced and developing countries. The ICT sector contributes significantly to fast technological progress and productivity gains. The economic opportunities created by ICT has highlighted by these words of linear' techniques such as print and television said to be limited by computers, which provide new ways of learning according to Burns, (2011). Old-fashioned methods stifle and discourage children's natural curiosity and inventiveness.

### **1.2.1 Geographic location**

Nepal is a mountainous country with limited resources and populations. The development of ICT is back and slow due to the hilly structure which imposes high transportation costs, and it requires creating an economy to spread the proper use of ICT.

### **1.2.2 Lack of ICT in all parts of a country**

ICT faces different challenges in many parts of the world. For example, in the Nepalese education system, information and communication technologies will play a crucial role. However, there is a lack of ICT and the proper equipment and service provision in many parts of the nation. Therefore, it is essential to assess the use of ICT in the education system. Moreover, a minimal population is capable to utilize the technology. Thus, infrastructure should be established in all country regions and following human resources for improved ICT.

### **1.2.3 Lack of skilled people**

Nepal has its challenges to ICT which negatively impacts education. The main concern for the ICT is that of their trainers. Unfortunately, Nepal has a very low skilled technical human resources as the drawbacks of successfully implementing, managing, and using ICT (Adam & Urquhart, 2007). The development of workforce and human resources is crucial on a national basis to manage the proper resources to all parts of the nations.

### **1.2.4 Lack of theories and frameworks**

Theories and frameworks about Nepal for ICT implementation in the educational sector are scarce. Therefore, sound approaches and mechanisms are needed to implement any ICT-enabled technology in the Nepalese educational system.

### **1.2.5 Politics and Policies implementation**

The increase in demand for new services brings more financial pressure to government and community schools. In Nepal, political issues including unstable government and poor education policies also hamper the progress on ICT a lot. Similarly, difficulties with the English language can also make teaching-learning in Nepal difficult (Bista, 2011).

### **1.2.6 Lack of research**

Many of the issues mentioned above have been taken into consideration by various authors and writers. Even though some people have conducted some studies, there is a lack of research regarding this topic. To the best of my knowledge, qualitative studies have not done to gain insights regarding this. Not much research regarding exploring the ICT and its use in government schools in Nepal conducted. Hence there is a need to have an in-depth study on the same.

As Pokhara is also taking advantage of ICT (Joshi & Manandhar, 2017) it is essential to understand the situation of ICT and the perceptions of the teachers and students regarding this. This study aims to undertake a deeper understanding of the experiences and perceptions of teachers and students in this city. It is a critical study as it will also work as a guide/ reference to the agencies involved in education or making educational policies.

### **1.3 Objectives of Research**

The primarily objective of this research is to explore and analyze the use of ICT in government schools with the perceptions of the teachers and students in Pokhara Metropolitan City, Nepal.

The specific objectives of this study are:

- The understanding of how teachers collaborate the ICT in the teaching process.
- Examine the factors that contribute to integrate the ICT in the government schools of Nepal
- The Perceptions of Teachers and Students and the Use of ICT in the Schools

### **1.4 Research Questions**

The questions of my research aim are to dig out the practices of the governmental schools, and developed accordingly:

- 1: What is the status of the use of ICT in government schools in Pokhara?
- 2: What are the perceptions of teachers and students about the uses of ICT in schools?
- 3: What problems do teachers and students face while integrating ICT in school settings?

### **1.5 Assumption of the Study**

The researcher believed that the ICT infrastructures are required to enhance the teaching and learning methods in the researched area of the Kaski District. For the researcher, it's the basis to analyze teachers' perspectives using ICT to promote teaching and learning processes. For this research, it is also essential that the respondents respond honestly and relate the truth data to their experience on ICT to promote education.

### **1.6 Organization of the Study**

The study encompasses seven chapters.

As part of the study's background, the first chapter discusses ICT in Nepal, including the country's current position, as well as its prospects and challenges. A brief introduction of the international context of ICT and the policies implemented in Nepal. This chapter presents and

provides the statement of the problem, the purpose of the study's objectives, and its research questions in the global context and the context of Pokhara Metropolitan City, Nepal.

Chapter Two presents and describes the literature review where it has classified into two different sub-groups which can be illustrated within the use of ICT at a global and national level. This chapter presents the rare writings in Nepal's context within the use of ICT in governmental schools in Nepal. While reviewing with the other developed countries' studies it was very much different wherein Nepal has very few studies found along with the progress in the stream of ICT.

In this chapter, the education system of Nepal is presented with Nepal's national policies that provide comprehensive information about this research. Besides, it will also address why and how the Nepalese Government intends to incorporate ICT in education, ICT technology, training, and curriculum development. Furthermore, the decentralization of school management systems is clarified. This chapter provides a framework to explore the barriers to ICT introduction in education policy and highlights the role that government authorities played or did not play in implementing the policy.

The third chapter provides clear insight of the theoretical framework of the study.

Chapter Four accommodates the research methodology and design of the study. This chapter has explained the various sources of information used and described and presented, raw data from the schools, policies, and official documents used in this methodological approach. Qualitative methods were used to explore the use of ICT in schools. It describes the rationale for selecting the study area, research design, nature and source of data, sampling, data collection techniques, data processing, and analysis. Finally, it presents schools and the participants involved in this study and the process of collecting information from the participants and their experiences and perception about ICT which is the gist of the data collection and became the medium to explain this analysis.

Chapter Five highlights the research findings addressing the research objectives. This section gives a clear vision of the research findings along with an explanation. Finally, this portion contrasts and highlights the use of ICT in Nepal. Questions intended to decide how ICT-based settings in the schools were implemented for teaching and learning process by the teachers and the students. How digital technology played a role to enhance the education of government

schools. This study also focuses on the government policies and technology in the education system in Nepal.

The perceptions of the teachers and students along with the qualitative analysis between teachers and students. It interacts with participants' ICT training encounters, pre-service teacher training, government-funded teacher training programs, and non-governmental organizations' role in ICT training. Finally, the paper highlights teachers' views of ICT assistance they got and explores in detail how well they equipped to use new technology in their teaching.

Chapter Six includes the discussion of the findings of the research questions. It gives clear insight using the different theories related to this research.

Chapter Seven summarizes the research findings with conclusions and recommendations. Next, it outlines the fundamental problems and their consequences resulting from this thesis. Finally, it makes numerous guidelines for the policies, strategy, implementation, and further research directions.

### **1.7 Significance of the Study**

This study has opened the door for other researchers focusing on the perceptions of teachers and students towards the use of ICT in Pokhara Metropolitan City. This study has included qualitative methods. This study will be helpful to create the required environment and developing infrastructures for the successful implementation of ICT in Pokhara Metropolitan City, Nepal in the present scenario. Hence, this study will be helpful for the new researchers, educational institutions, and it also helps formulate the required policy for the government. This study digs into the status of ICT in Pokhara, Nepal, examining teachers and students' perceptions. This study aims to undertake a deeper understanding of the experiences and perceptions of teachers and students in this city. It is a critical study as it will also guide/reference the agencies involved in education or making the policies.

### **1.8 Limitations of the Study**

This study has carried out for the partial fulfillment of the Degree of Masters' in International Education and Development as per the requirements of Oslo Metropolitan University. Hence, this study has done in a time with the global pandemic of the Coronavirus. Due to the

constraints caused by Covid -19, the researcher was limited within his activities. Nevertheless, he traveled to Nepal to collect data during the last exam and then corona time.

There were 8 respondents including from both schools, students, teachers, and the headteachers for a qualitative study. Instead of the present sample size, a bigger sample size would have been ideal. The research has been related to exploring the government school settings of ICT in the classroom, teaching, and their coordinates to the government policies. This study carried out in Pokhara Metropolitan City, Nepal. This research might have explored more issues. It mainly focused on teaching and learning, but it also covered different topics such as gender, ethnicity, and cultural perspectives.

## **1.9 Summary**

The background for this research, problem statement and research issues has been presented in this chapter. In addition, the aims of the study were outlined, the importance of research, research in the context of Nepal, theory, and knowledge contribution. This chapter also expands the structure of the remaining chapters. The following is a literature review of the areas relevant to this study.

## **CHAPTER II: LITERATURE REVIEW**

### **2.1 Introduction**

The acronym of ICT refers to Information and Communication technology, Blurton (2002) emphasized that ICT is various technological tools and services for the communication, development, distribution, storing, and management of information. The term ICT refers to modes of technology used for communication and knowledge processing, storing, product, sharing, or exchange. As Daniels (2002) states, ICT has been one of the fundamental building blocks of contemporary culture within a brief span. The broad ICT concept encompasses such technology as radio, television, recording, telephone (fixed and mobile), computer and network hardware and software, and related devices and services (TVN, 2016). Many nations now recognize ICT comprehension and mastering, alongside reading, writing, and numeracy, the fundamental skills and principles of ICT as part of schooling. Teaching is a means by which the teacher, the learner, the program, and other factors are regularly coordinated to achieve pre-defined goals and targets. When implemented successfully into teaching and learning, information and communication technology ensure the connection between teachers and students and hence the growth of cognitive skills (Jones & Cress, 2001; Punie et al., 2006). Therefore, the urgent need for education to adapt to this environment and integrate Information and Communication Technology (ICT) into schools, in line with the requirements of society, has become imperative (Kreps & Kimppa, 2015).

One of the main aspects of research science is the literature review. It focuses on well-known problems relating to science and offers an insight into the analytical and theoretical methods used in this field. It allows the researcher to analyze the result and gives much knowledge about prior mistakes through the literature review (Bryman, 2015). The literature review chapter will include further information on ICT studies at the global and national levels with the policy on government organization of classrooms, teaching activities, and facilities. I found that only some research analysis was conducted on ICT in pedagogy and its effect on government schools in Pokhara during this research context. Against this context, very few studies with published research have been performed in rural Nepal. Therefore, the researcher tries to use some theories to clarify the concept that is related to the subject field.



The researchers found that a selective literature review is being used for this study, which was also the demand of the research. For this subject ICT, with its possible procedures, its future ICT reach, has applied and analyzed possible research queries and problems. The study was undertaken to pick a literature review from a global viewpoint, including an underdeveloped one and the related aspects of Nepal were checked. The paper is categorized as seeing whether in developed or developing nations there are meaningful or valuable ways which the government of Nepal can trail to include ICT in education in Nepal effectively. (Wims & Lawler, 2007) stated education as the factor to unlock the door of development whereas information technologies are rapidly opening the door to education. The ICTs have, without doubt, influenced teaching, learning, and research whereas Eady and Lockyer (2013) highlight the importance of ICT in education is represented to build the nation. These and many other aspects lead to the implementation of ICT in teaching and current developments as we talk about ICT and transition into the 21st century. It indicates that soon we will see significant improvements to the way curriculum is designed and provided and to the world's ICT prospects and opportunities (Oliver, 2002). It also aims to research the possible improvements that ICTs would see in education as a potent agent for improving much of the school traditions we are used to it.

From a global perspective, the literature has been confined to a more national background, though at the same time continuing to concentrate on the application of ICTs in education.

The researcher explores the ICT in international study and hypotheses by analyzing the ICT subject available in Nepal. I review the policies on ICT-based teaching and learning, which influence the school system in the process of students' and teachers' learning, with the consideration of ICT content. Consequently, I study research focused on the positions of government schools in Nepal.

In a review of the topic about ICT available in Nepal, I tried to dig out the content of ICT in international research and theories. With the global analysis, I review that the ICT-based teaching and learning, the policies impacting the schooling system with considering the content of ICT in the teachers' and students learning process. Therefore, I review the research that is based on the roles played by the government schools of Nepal.

## **2.2 Introduction to Nepal**

### **2.2.1 Geographic Aspects**

Nepal is a tiny landlocked country situated in the northern hemisphere. It is located between the People's Republic of China along the north border and India into the south, east, and west. The nation became the Federal Democratic Republic after King Gyanendra was overthrown by the popular revolution in 2005. Geographically, the country is split into five distinct regions, 14 zones, and 75 districts of growth. It is divided into three areas and is mountain, hill, and terai regions also regard as ecological belts (CBS, 2002). The five development regions are Eastern, Central, Western, Mid-Western, and Far-Western. Nepal covers a total area of 147,181 square km and occupies only 0.03 % and 0.3% of the total land area of the world and Asia respectively. Stretching with the east to west with a mean length of 885 km whereas widens from north-south with an average breadth of 193 km (CBS, 2011). Kathmandu is the capital of Nepal which lies in the central part of the territory.

The geographical altitude varies between 80m in the lower Terai area and 8848m in Mount Everest. The geographical region includes the Terai region (60-305 m), the region Hilly (up to 3000 m), and the region of the Himalayas (above 3000m).

Nepal is characterized by ever-lasting rivers, stunning lakes, snow-capped mountains, cliffs, thick forests, and glaciers springs. More than 6000 rivers flow all year round and hydroelectricity is generated from these rivers too.

Approximately 27 percent of the entire land is comprised of forests. The area protects diverse ecosystems and has a biodiversity climate. To safeguard various habitats and endangered species, the government of Nepal has established nine national parks and 3 natural reserves in certain zones of Nepal. There are also established 3 wildlife reserves. (CBS, 2013). There is also a famous saying in Nepal as 'Hariyo Ban, Nepalko Dhan` which symbolizes the meaning of green forests is the Nepalese wealth which is also the beauty of Nepal which attracts the tourism industry to boom the economy of Nepal.

### **2.2.2 Demographic aspects**

The population of Nepal as of the census day (June 22, 2011) stands at 26,494,504 [Central Bureau of Statistics (CBS) 2011]. Nepal is a multiethnic, multilingual, multi-religious, and multicultural country where according to the census, 123 languages are being spoken in Nepal

whereas 125 Caste and ethnic groups are residing in a uniquely harmonized Nepalese society. The annual growth rate of the population is 1.35 per annum and there is a total of 5,427,302 individual households (CBS 2011). From the same census, it is found that 6.7, 43.0 and 50.3 percent of the total population is living respectively in the Mountain, Hill, and Terai (CBS, 2011; CBS, 2013).

According to the Central Bureau Statistics, the life expectancy rate at birth is 64.1 years, and for people aged 15 or older years for the literacy rate is 55.6%, for men 70.7 and wo43.3 (CBS, 2011).

### **2.2.3 Religious Aspects**

Most of the Nepalese population belongs to the Hindu religion. With the CBS, 2011, Nepal has 81.34% Hinduism, 9.04% Buddhism, 4.38% Islam, 3.04 percent Kirat and 1.40% Christianity whereas these five religions make up over 99% of the total population, Jain (0.01%), Prakriti (0.46%), Bon (0.04%) and others (0.007%). The remaining less than 0.23% of such religions are not defined yet. Also, the exciting fact is that the Prakriti and Bon religions are registered only in the 2011 database (CBS, 2013).

The Hindu system also consists of four castes: Brahmin, Chhetri, Vaisyas (Newars), and Sudra (Dalits), the highest caste is Brahmin, the least and the least backward caste in Dalits (CBS, 2002). There are also ethnic groups (Janjatis), who belong to the faith and have their er tongues and indigenous traditions but are not classically four-folded by the Hindu hierarchical caste. Janajati groups have traditionally inhabited a specific habitat or territory and hence many say that they are the real "first people" of Nepal which is also called (Adivasi).

According to the 2001 census survey, 65 percent of the general population falls under the Hindu caste system whereas 31% belong to Janjatis (indigenous) and 4% to some of the other caste-ethnicity. In different parts of the nation, there are at least 92 mother tongues (CBS, 2002).

### **2.2.4 Literacy Aspects**

It is reported that the literacy rate of the Nepalese population was 54.1% in 2001 which then increased to 65.7% in 2011 where the literacy rate of both the male and females were 75.1% and 57.4% respectively. (CBS, 2013). In this data, 12.11% of individuals in urban and 1.24%

individuals in the countryside possessed internet in their homes. This demonstrates that the status of computers and the internet is deficient in the rural areas of Nepal. As of 16<sup>th</sup> July 2018, a total of 39,202,554 mobile numbers were registered in the country for the population of 29,291,746 which is 33.83% higher than the population according to telecom statistics.

### **2.2.5 Economic Aspects**

As we discuss the Nepal economy, the studies show Nepal and its poverty rate as fundamental national indicators is 30,8% of per capita GDP which is just \$473 (CBS, 2011). Agriculture's the significant economic activities providing 37% of GDP while manufacturing accounts for 20% and service offers 35% of GDP. Tourism accounts for 9.4% of Nepalese overall. The poverty headcount of 25.2% and GDP per capita of \$717 (CBS, 2013). The Human Development Index (HDI) places Nepal at 144 out of 169 nations with HDI values of 0.428, by the United Nations Development Program (UNDP 2010) which indicates the economic status of Nepal to make the policies and budgets for the nation.

## **2.3 ICT in the Global Context**

(Christensen, Horn & Johnson, 2008) stated that the ICT was not primarily designed for education but (Laurillard, 2012) its use of educating and learning has indeed, progressively become a central component of educational policies and scientific study. ICT is not only the foundation of the information community but also a very effective tool and instrument for improvements to strengthen the training framework (Pelgrum, 2001). Generally, ICT in education also known as e-learning is the approaches like one-to-many, one-to-one, one-to-alone, or self in communicating and learning process. The valuable roles for ICT and the technology to support effective pedagogy, as mentioned by Jonassen (1999) as (TVN, 2016) as the tool that helps the knowledge buildup and also to the learning by construction as a context to support learning by doing, as a social medium to support learning by conversing, as an intellectual partner to support learning by reflecting, and as information vehicle for exploring knowledge.

Responding to an understanding that ICT will be a fundamental requirement in the 21st century, many countries in Asia have policies on ICT in education that set out general

principles, guidelines, and strategies (UNESCO-IS, 2014). Some countries have stand-alone, which may or may not have a sector-wide ICT plan and some others have a national ICT master plan that includes components on education or a national education plan that include ICT component.

The first appeared policy in the world, the declarations of Millennium Development Goals (MDGs) target 8.F, as “In co-operation with the private sector, make available the benefits of new technologies, especially information and communication” (UN, 2000) which did not explicitly mention in Education in All goals, though ICT plays the vital role in acquiring specific goals like broadening access, eliminating exclusion, and improving quality (TVN, 2016). The World Summit on the Information Society (WSIS), and with its ten targets and aims that are conveyed between 2003 and 2005 to be achieved in 2015 which of target 2: connecting all primary and secondary schools to ICT. Sidorenko and Findlay (2001) emphasized the significance of national policy on the implementation of any emerging technologies. Along with that Farrell and Wachholz (2003) highlight in the ICT policy formulations and creation, the production and access to ICT facilities, curriculum development, program interventions, and instruction given to educational workers, countries at various stages both of their development and implementation.

Moreover, within the framework of formal commitments, national plans to implement ICT objectives in education take on many forms including strategy papers, investment programs, decrees, and regulations that establish programs with short-to-medium-to long-term targets (i.e., usually 5-10 years plans) aligned with longer-term goals and objectives (UNESCO-IS, 2014 as TVN, 2016).

In the process of transformation, the computer has been modified more easily in academics than in other audio-visual media. It's attributed to a computer's ability to manipulate words and symbols. ICT influenced eLearning and distance learning. In e-learning, the obstacles to higher education have been eliminated. It has reinforced both constructionism and constructivist concepts of thinking. Many researchers felt ICT was the crucial milestone:

- a) access to teaching and tools for learning.
- b) the enhancement of the quality of education.
- c) incorporating adult life-long learning (Bates, 2000b; Hefzallah, 2004; Oh, 2003; Tinio, 2000).

The utilization of online pedagogy is growing within the governing body and the academic institutions, ICT integration in the education system can be possible (Alam, 2016). The adoption of the Wi-Fi infrastructure has contributed to the creation of the high-level education system, where the students can conveniently acquire responsibilities and access to the subject materials. The use of ICT has advanced science, as computational power & bandwidth have steadily increased, making complex calculations easy to do. Via contact networks, rather than focusing on one organization, study teams may be distributed internationally. It has also allowed study resources for smaller institutions to be extended by equalizing access from digital archives to scholarly content. Therefore, to have an optimum impact of ICT in education, specific issues such as how ICT implementation can be effective and what the requirements are to achieve, etc. are to be addressed. Modern developments indicate that higher education will shift due to the proliferation of resources in ICT use (Oliver, 2002). Technology can replace some facets of education and learning and can improve or enhance teaching/student contact.

## **2.4 The Education system of Nepal**

### **2.4.1 Ministry of Education**

Nepal's Ministry of Education (MOE), set up after the dawn of Democracy in 1951 and is the only organization that is responsible for the overall development of education in the country and of all educational organizations. The Ministry of Education and Recreation was renamed in 2002. In 2008 again it was renamed the Ministry of Education with the cabinet decision and remained so until now. The ministry is headed by a political cabinet minister while at the bureaucratic stage two secretaries head the Ministry of Education (MOE, 2010).

The Ministry is responsible, through the institutions under its authority, for formulating educational policies and plans and overseeing and enforcing them throughout the country. For instance, the Ministry's Central Level Agencies (CLAs) are responsible for planning and executing, and track their activities. The district agencies have the responsibility of overseeing the services conducted by five Regional Education Directorates (REDs). There are 75 District Education Officers (DEOs), and 1091 sub-district Resource Centers (RCs) are the keys to

educational strategies, initiatives, and services administering agencies at the regional levels. Furthermore, the responsibilities of the Ministry are classified into four categories which have each head secretary with a first-class officer (MOE, 2010).

MOE defines its functions with its four divisions into

- 1) Administration aspects- Personal management and growth are the core functions of the administrative division. It is responsible for hiring, transition, promoting, and building the capability of workers, and the acquisition and maintenance of resources.
- 2) Higher education and its management aspects- The functioning of the higher education and its management teams are responsible for the overall higher education with the scholarships and the technical learning.
- 3) Planning aspects – This is the entrance point for donor organizations in the education field which also manages the international assistance to execute education services and initiatives responsible for policy formulation and research.
- 4) Monitoring and the evaluation aspects- In this section, the Monitoring, evaluation, and supervision section operations are carried out simultaneously with the execution of the program with the management of education statistics data (MOE, 2010).

#### **2.4.2 Department of Education**

One of the prominent institutions within the Ministry of Education is the Department of Education (DOE). The DOE was set up in 1999 to formalize and establish Basic and Primary Education programs (BPEP) (MOE, 2010). Most tasks undertaken by the BPEP were transferred to the Department after the department was set up and the BPEP ceased functioning as a project. This indicated that BPEP II was often referred to as fundamental and primary education-related departmental operations. The Department is currently taking responsibility for the delivery and supervision of academic departments in the country, including its direct command line with provincial and district bureau and the entire accounting and management authority.

Under the educational regulations of the DOE, schools with funding from the government are governed by school management committees (SMCs). SMCs, curriculum contents, materials and textbooks, and test structures are composed in a standardized way across the nation. The DOE also appoints the staff, including the headteachers whereas it also assigns District Education Committee (DEC), which also nominates the SMCs in exchange. The governmental district office is led in all 75 districts in the country by a District Educational Officer in the DEC. Indeed, this is the most significant unit for which duties are allocated to incorporate any school. The DEC must create the timetables and calendars, assign the teacher's wages and compensation, teacher preparation services, supervision, and academic accounts (MOE, 2010).

The education system is the banking system in Nepal where teachers teach the course, and the rest must listen to the paper works. There would be hardly any interactions between the teachers and the students. The formal structure of education consists of primary (Grades 1 to 8), high school (Grades 9 to 12), and tertiary education (Bachelors, Master, M.Phil., and Ph.D.). Besides this, there is also the provision of Technical School Leaving Certificate (TSLC) and Diploma qualifications (MoES, 2005) which is presented below, and those who do not complete basic schooling also have non-formal literacy and life-skill programs available.

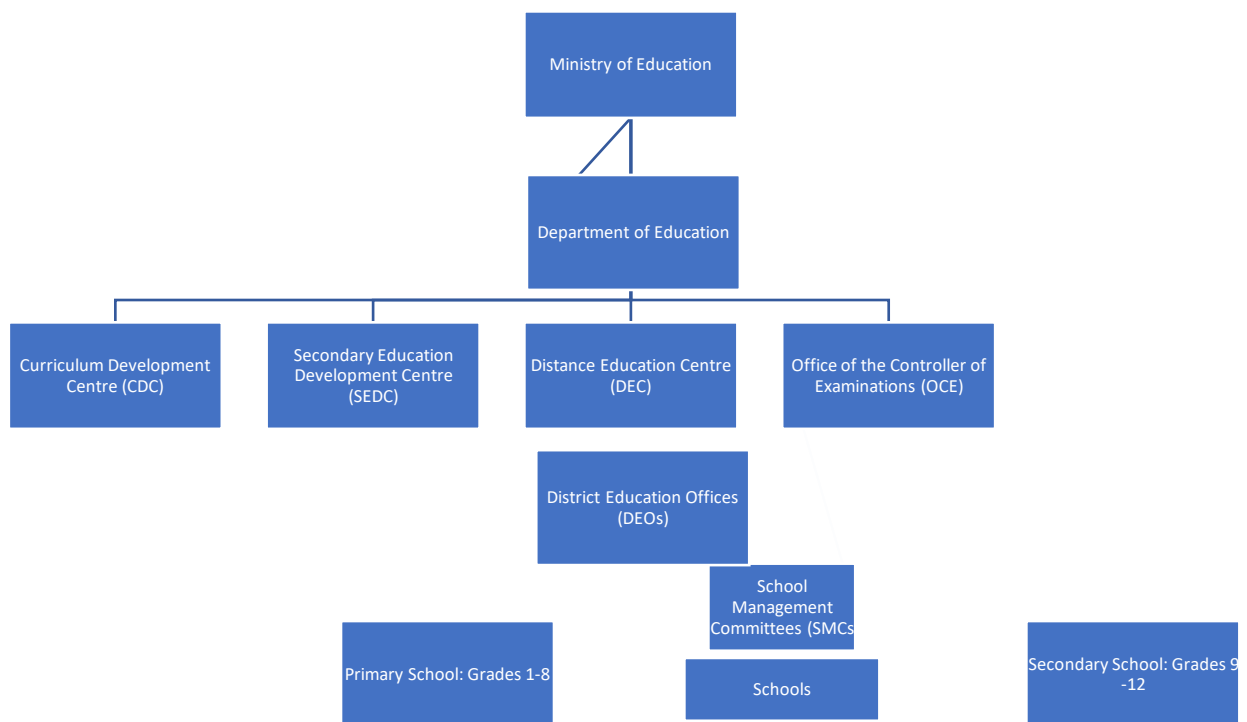


Figure 1 Education system in Nepal



The education system structure of Nepal presents with the Department of education has divided school education into basic education and secondary education. Grade starting from 1 to 8 is primary and 8 to 12 is secondary education. The education system consists of six sections that cover the pre-primary grade which is below grade 1 where Pre-primary education is rife in the private sector.; The primary level consists of 1 to 5 grades; the Lower Secondary level covers from grade 6 till 8 grades; The Secondary grade starts from 9 till 10 grades, the higher Secondary grade starts from 11 till 12 grade and the Higher Education and the University level. (MOE, 2010). Higher education consists of three/four/five years of bachelor's degree, two years of master's degree, two years of MPhil, and a Ph.D. The language of instruction and examination is both Nepali and English. The examination is held once at the end of the academic year for most programs, while it is half-yearly for some. From the academic year 2015, TU has started the semester system in the university campus and plans to implement this to all campuses throughout the country by the forthcoming academic session.

The total schools according to the form of school, level, and the development in the level around the country. From the data of CBS, there are about 31,655 primary schools, 11,341 Lower secondary schools, 6,928 secondary schools, and 2,512 higher secondary schools in the country. Besides, there are 9,538 schools in the central region of Nepal, the highest among all the areas 2,213 are in the valley of Kathmandu alone (CBS, 2010).

### **2.4.3 Education: Then and Now**

The contemporary Nepali education system was in the transition phase from the absolute monarchy to a more representative political system and did not evolve before 1951 despite the political setbacks over the following timeframe. Nepal's education system was still dominated by wealthy elites in the 1950s, when literacy rates were low, and the number of schools was restricted. The country did not have any universities at that time. In Nepal's traditional Hindu-dominated society, women were discriminated against and discouraged from entering school. Since then, access to education has significantly expanded in Nepal. The Reforms made by the Government of Nepal in 1971 with the National Education System Plan creating a much more modern and egalitarian education system with compulsory public primary education. There are now 35,222 elementary and secondary schools and 10 universities with more than 1,400 colleges and campuses throughout Nepal (Ministry of Education 2016). Expanding the opportunities with the education is a priority of the government. The current 2016 School

Sector Development Plan seeks to graduate Nepal “from the status of least developed country by 2022 through strengthening... access and quality of education” (Dilas, 2018).

In Nepal, primary education is compulsory for girls, boys, disadvantaged or disabled people, and ethnic groups (EFA, 2004-2009). In 1980, the NER was just about 16 percent for primary students, but by 2003 it rose to 83.5 percent (MOES, 2005a). Similarly, in the past few decades, there has been substantial growth in the number of educational institutions. This country of 28 million has always been facing significant challenges in retaining its students, particularly at the primary school level. However, 19% of the population aged between 5 and 16 is not in education. Primary school children, at the age of 6-10, would need to register and get compulsory primary education (EFA, 2015). In the same year, Nepal increased primary education access – net enrolment ratio (NER) reached 96.6 percent, survival rate 89.4 percent, and the literacy rate (15-24 years) 88.6 percent in 2015. The gender inequality will be achieved at primary and secondary education levels with gender parity index (GPI) scores of 1.09 in primary and 1.0 in secondary education in 2015 (National Planning Commission, 2016).

## **2.5 Public and Private schools in Nepal**

In Nepal, the school education system is classified into two parts and they are public and other is private schools. In general, the schools that are aided, governed by the government are public schools whereas the schools that are governed by private people, associations, non-governmental organizations are called private schools. Furthermore, the Nepalese Ministry of Education segregating public schools into two categories and they are described as aided which is a public school getting the regular subsidies from the budgets of the government to pay for the teachers and their administrative costs and maintenance whereas the second one is non-aided which is also a public community school to which it does not receive the regular subsidies but it will get support by the local communities, donations, and other extra supports and sources.

The higher financial portion of government spending goes on education in Nepal and is generally spent on the wages and pensions of teachers and employees. For example, in a study undertaken at the Centre of Educational Research, Innovation and Growth Center in the mid-1990s, expenditures for teachers and staff were 86 percent in public primary schools, compared

to 63 percent in private primary schools (MOE, 2010). This wage spending in public secondary schools was 76% in the public sector and just 52% in the private sector (CERID, 1996; MOE,2010). In recent research of EFSG by the Ministry of Education (2009), about 80 percent of a public school's overall awards and budgets in an academic year go to teacher wages and benefits and also funding the building construction. The governmental report also shows that the expenditures on the overall teaching and learning supplies for education, teacher capacity building of the teachers and students, library growth and computer training, and ICT settings in the institutions are minimal.

In Nepal, there are currently 41,959 public schools and 10,477 private schools, and 31,655 primary schools where the public schools make up about 80 percent of these schools, and the rest 20 percent covers by the private schools. There are 4,715 public and 2,213 private schools with the secondary level which consists of 9th and 10th grades. The Five universities with 834 parts constituent and affiliated campuses with higher education are there in different parts of the nation. In total, there are 7,9 million students enrolled in both public and private schools with 251,805 teachers engage in the teaching and the learning process, including in all schools (MOE,2010). The percentage of the overall registration at public and private schools is registered. The secondary level indicates 83.1 percent and 16.9 percent in public and private school enrollment respectively.

Performance gaps, inadequate infrastructure and services, low-quality teachers, and poor management and regulation are generally related to public schools. Analysis has shown that public schools in Nepal have failed to add value in terms of students' cognitive growth (Caddell, 2006; Carney, 2003; MOE, 2010). The standard of teachers and school equipment used in schools are specifically separate between the public schools from private schools in Nepal. In the Government schools of Nepal, The School Teacher Record Office (STRO) is accountable for quality control of the teachers' records in public schools, where the teachers have been found very selectively tracked and supervised. Consequently, in public schools, teacher absenteeism is a significant issue. Whilst most public schools tend to have their classrooms and grounds. The educational equipment they are left behind by the use of new teaching devices, such as the use of chemistry labs and computers in compared with the private schools (Bhatta, 2005; SMAERC, 2008; MOE, 2010). The other reasons that attribute between the public and private schooling are determined by the student's demographic functions. Private school pupils are traditionally wealthy and middle class and belong to the upper-class society

and they will prioritize the private schools whereas the public-school pupils are primarily medium-sized or disadvantaged families. The majority of lower-class and underprivileged students attend public schools. Thus, the importance of favorable peer effects in the case of private education is stronger than in government schools when it comes to learning.

Along with these factors, political instability also plays an adverse role in the imbalance of the public and private schools in Nepal. Public school teachers, as well as students, are more involved in politics and its activities than the teachers and students from private schools. During the Maoist insurgency from 1996 to 2005, both types of schools were affected in different ways whereas (Caddell, 2006; 2007) the 'people's war', schools infrastructures were destroyed and also the school principals and teachers were harassed and some were killed too. However, public schools were directly affected.

## **2.6 ICT policies in the Nepalese Context**

Nepal has operated over the past several years on several policy measures in the IT market. In turn, the government policy on telecommunications formulated during 1992 paved the way for the telecommunications industry in Nepal to liberalization and in 1997, it was implemented by the Telecommunications Act and Regulations. This represented a significant breakthrough in the form of a consistent legislative and structural regulatory system for the industry. Based on these measures, a new telecommunications strategy which was announced in 2004 laid the critical cornerstone, inter alia through the implementation of technology neutrality and transparent licensing system, for further intensification of the sector liberalization process. The IT Program was also the first policy initiative announced in the year 2000 to make IT a production and growth instrument of its kind.

This strategies and tactics aim is to create a framework detailed "Digital Nepal" view. According to this vision, IT is a vital impetus for transforming Nepalese society into an information and knowledge society and enhancing Nepal's pursuit of equity and economic development by exploiting ICT. Government-led and private sector-led execution of this strategy. Public-private partnerships (PPPs), particularly in matters and projects of national significance and character, shall form one of the core principles of implementation of this policy. The government will take a leading role in promoting mobilization, primarily to

broaden the broadband access and enforce the whole program, the investments, and services necessary to establish a nationwide information technology backbone.

The first appeared policy in the world, the declarations of Millennium Development Goals (MDGs) target 8.F, as “In co-operation with the private sector, make available the benefits of new technologies, especially information and communication” (UN, 2000) which did not explicitly mention in Education in All goals, though ICT plays the vital role in acquiring specific goals like broadening access, eliminating exclusion, and improving quality (TVN, 2016). The World Summit on the Information Society (WSIS), with its ten targets and aims that are conveyed between 2003 and 2005 to be achieved in 2015 which of target 2: connecting all primary and secondary schools to ICT.

Moreover, within the framework of formal commitments, national plans to implement ICT objectives in education take on many forms including strategy papers, investment programs, decrees, and regulations that establish programs with short-to-medium-to long-term targets (i.e., usually 5-10 years plans) aligned with longer-term goals and objectives (UNESCO-IS, 2014 as TVN, 2016).

Responding to an understanding that ICT will be a fundamental requirement in the 21st century, most countries in Asia have policies on ICT in education that set out general principles, guidelines, and strategies (UNESCO-IS, 2014). Some countries have stand-alone, which may or may not have a sector-wide ICT plan and some others have a national ICT master plan that includes components on education or a national education plan that include ICT component.

The government must be active in establishing a national policy. ICT curriculum policies and services were established before the National ICT policies and from 1980, piloting radio teacher training programs English as a subject (grade 5) and social study subject (grade 4) in the years between 1975 and 1980. Since it is deemed necessary that the National Contact Strategy is drawn up in 1992. This effort paved the way for telecommunications market liberalization and followed the National Telecommunications Strategy 2004, which further accelerated the critical work on the mechanism of business liberalization by implementing technical neutrality and the transparent licensing system (MOIC, 2015). Following these previous measures, the first National Information and Technology (NIT) strategy announced in 2000 was to make IT a vehicle for growth and development, and in 2010 it was updated

(MOIC,2015). Nepal has IT difficulties, like many developing countries, because of the lack and not proper use of a national IT plan and policy (Adam & Urquhart, 2007) likewise in the Maldives.

The Government of Nepal has a detailed Information Communication Technology (ICT) Policy to develop and integrate ICT in education (Nepal, 2013). With the vision of changing Nepal to an educated and learning-based society by 2020 through a huge extension of ICT the nation over. The objectives of the ICT strategy express that over 75% of Nepali individuals will be digitally educated. 90% of the population will approach broadband where each resident will approach the internet facilities and 80% of government administrations will be given through online frameworks. (Communication, 2015). These are the major policies and plans of the Government of Nepal. Nepal has developed and implemented several policies and programs provided that heavily emphasize ICT on education, like the National IT policy (2010, 2015), 10th plan (2002-2007), Three Years Interim Plan (TYIP, 2007-2010, 2010-2013) (Nepal, 2013), School Sector Reform Plan (SSRP, 2009-2015) as (TVN, 2016) where the appropriate measures will be taken to facilitate and promote the integration of ICTs within the entire Nepali educational system and to support the administration, pedagogy, learning and research regarding improve the quality of education and training at all levels and enhance access to education.

Therefore, to have an optimum impact of ICT in education, certain issues such as how ICT implementation can be effective and what the requirements are to achieve, etc. are to be addressed. As a result, ICT integration in the education system can be possible (Alam, 2016). In Nepal, some of the ICT Projects launched with the non-governmental initiatives were Open Learning, Exchange (OLE-Nepal), OLPC (One Laptop Per Child), Nepal Wireless Networking Project (NWNP), HRO Nepal, Information Technology Society Nepal (I, TSN) and many more (Dhital, 2018) which is very essential for the need of the people in this technological world.

With the context of ICT in Nepal, there is a very short history of mobile technology, but the computer has been introduced in 1971 with its first model IBM 1410 in Nepal for the statistical data for the 1971 census as mention by Chapagain, 2006 as in the same year telecommunication services also been explored by GON to modernize its projects.

Despite significant educational interference, government education plans have struggled continuously. The schools are suffering from a lack of exposure, low enrollment, and retention rates (at all levels of the students, and a poor standard of education. Besides, differences are rising in diverse regions and social classes. There are insufficient management capabilities and inadequate structural funding and finance within school districts. Apart from the bad teacher qualities, the lack of morality and disenchantment with public education has led to political involvement with teacher appointments and transition (Carney, 2003).

## **2.7 Using ICT in the Teaching and Learning Process**

Several studies have been done from case studies to research, on the value of ICT and why it is used by students. While studying and teaching the ICT, it plays different roles. Several researchers stressed ICT implications in classroom teaching which has many potentials to uplift the student's goals to improve in their studies and the teacher learning.

In academic institutions, the system and how services were administered had offered little choice for learners. Students were usually expected to embrace what was offered and organizations were mostly stable and conservative in respect to curriculum implementation. ICT provides multiple opportunities and options and today, with the choices they offer to the students, many institutions build competitive edges. These options vary from where you can figure out where you are studying.

## **2.8 Introducing the theory**

According to Oliver (2002), growing understanding and acceptance of alternative learning topics has coincided with the advent of ICTs as learning technologies. (Duffy & Cunningham, 1996; Vygotsky, 1978; Oliver, 2002) the learning theories which dominate today are based on constructivist principles which play a key part in the learning and perception processes in constructivist theories. These concepts make it possible for learning to be done by an active awareness construction enabled by diverse experiences in concrete contexts.

The strengths of constructivism are their focus on learning in ways that are active and interpretative as a method of personal comprehension and the creation of meaning. This area of learning is known as meaning-building instead of factual memory (e.g., Lebow, 1993; Jonassen & Reeves, 1996 as Oliver, 2002).

Learning approaches using current ICTs provide many options for constructivist learning through their provision and promotion of services-focused, student-centered environments and learning that is context-related and practice-oriented (e.g., Berge, 1998; Barron, 1998; Oliver, 2002). As stated earlier, the use of ICT in learning environments will help different facets of information creation and as ICTs are increasingly used by students, their effect is more pronounced.

## **2.9 Definition of terms**

**ICT-** The word ICT stands for the Information and Communication and Technology that generally identifies to technologies that give access to information and knowledge to human beings. According to Toomey, (2001) as Sarfo, Amankwah, Agyen and Yidana, (2016), it is related to those techniques that are used for accessing, gathering, manipulating, and presenting or communicating information. The technologies that are used to provide the information could be included like computers and other information providing devices, the hardware and the software, and websites that linked with the internet portals, networking systems, etc. The most frequent uses of ICT are based on computers, and their applications, and the medium of transferring and communicating devices with the changes at a fast pace that represents to one of the other with its function.

**ICT in education** – It refers to the utilization of distinctive innovations Morgan, K., Morgan, M., Johansson, L. & Ruud, E. (2016) as an instrument to move forward the education and its learning approach with its quality of education are assigned as ICT of education. The educational ICT tools can be classified into three categories as input, output, and others (relative devices).

**ICT-based classroom** -According to Cox, 2019, the classroom is equipped with modern technologies like a computer, projector, and interactive boards. Teachers can use these technologies as an innovative tool of their instructional method.

**Digital Content-** Making an audio or visual or audio-visual presentation of the topic by using technologies primarily by a computer program, which will be used for teaching in the



classroom. These contents contain an exclusive narration of particular lessons and make more interaction between teachers and students.

## **2.10 Summary**

In this chapter, several topics relating to this research were attempted to learn from literature, theoretical and scientific knowledge. The literature review revealed such problems as, teaching attitudes, teacher skills and confidence, efficiency, inadequate ITC infrastructures, lack of technological assistance, and lack of appropriate learning as the challenges blocking ICT from being used to improve education. Besides, the literature review described problems such as interactivity with people, education resource distribution, and access to the global knowledge base. It helped to connect with education services as the advantage of using ICT to promote education. Furthermore, the factors which have an impact on the productive use of ICT in public schools were described as issues such as positive attitudes towards ICT, computer self-efficacy, teacher job experience, professional development, usability, and the provision of technical help. This thesis emerges from the researcher's thirst to investigate teacher perspectives in the use of ICT in selected schools the in Kaski district to the aid teaching and learning process.

## **CHAPTER III: THEORETICAL FRAMEWORK**

### **3.1 Introduction**

In this chapter, the theoretical framework emphasizes the concepts and the ideas of this research that I am presenting. The theory and the research play vital roles to have good social research. In the research, the theory makes it more clear how it can be conducted to clarify its relationship (Bryman, 2008:6). The limited data size of the study makes the researchers make some choices. For this concept and the ideas, Vygotsky (1978) puts his thoughts and the guidelines of the framework which will be further discussed.

With the theoretical framework, the use of ICT along with the teachers and students regarding the teaching and learning processes will be highlighted. Along with that, the development of technology makes it more convenient for the literature that can be used for contemporary aspects. In any research, the theory puts value on the relevant information which guides the research. Literature is the source of the information where it takes the research in a direction assessing the ease of the research.

### **3.2 Research Paradigm**

Huges (2001, p.32) explores paradigm as, ``a specific collection of beliefs about the knowledge and our relationships with knowledge, together with practices based upon those beliefs. It also addressed the paradigm as to which how the problems were understood and solved. It is the beliefs and assumptions that comprise the research with the different components like the ontology which expands about the reality, epistemology reflects about the something known and the methodology as the research findings where it also clarifies the relation of these factors.

In the research, the ontology and the epistemology give the holistic approach of the information and ideas what the researcher has the methods adds such views into the findings and the results. In this study as a researcher, I tried to explore these approaches to construct knowledge about them.

The beliefs about the ICT in early ages in the research country depending on the researcher's views are so different from now. It is still backward about the vision of ICT implementation in the practice areas as the policies were formulated quite a few years ago. It was a very challenging time for the researchers to even imagine the digital world for the children and into their future. When seeing around the modern world and its fast-paced technology, I tried to highlight the ICT uses for children in natural settings and making the relation in teaching and learning process as the social phenomena.

### **3.3 Social Constructivism Paradigm**

The theme of this study is that the researcher tried to relate the situation with the social constructivism paradigm. In this continuum, constructivism and its concepts are further classified by the different prior researchers within which the constructivism paradigm work based on Jean Piaget; radical constructivism based on Ernst von Glasersfeld; social constructivism thoughts based on Lev Vygotsky which has been discussed further in the study.

The social constructivism paradigm was propounded and developed by Lev Vygotsky. According to social constructivism, (Vygotsky, 1978) who suggested that the learning is a collective and collaborative process where the information and the knowledge are the outcomes with the process interacting between the people and the culture and their environment. He also reflects that the role of each child in the cultural development occurs twice; first with the socio-cultural aspects and next within themselves, and their learning processes from the social interaction (inter-psychological) and the other is within the child (intra-psychological).

The other writers also explained much about social constructivism which contributes more information to the researcher to dig out the queries. Constructivism (Elliott, 2000, p. 256) explains the approach and the learning method which encourage people to develop or to create their understanding with the knowledge that relies on the learner's experiences. The theme of social constructivism is that the knowledge of human learning is constructed and with that knowledge, the learners build the other knowledge topping with it. Philips (1995) based on this approach; the previous knowledge of human beings will impact the new ones that people will build from the acquiring methods of knowledge.

From the social constructive point of view, (Postholm, 2005), the participants such as children are the active learners who gather and gain knowledge through their learning process also by doing the interaction with other people. In this aspect, the knowledge and the ideas that participants had about something cannot be constant where the learning something is an active process as they might acquire more and different ideas and information which might change their perceptions towards the things and it also change their thinking patterns. This will go on and on whether the learners will build up their knowledge based on their prior or passively absorbed knowledge.

If the teaching and the learning process are passive, then the learners are like empty vessels where they need to know about it. Within this, the social constructivism elaborates the situation of learning are based on the active interaction with the teaching and the learning process where the information can be received passively, but it cannot be interpreted because it needs to be connected meaningfully to the previous and new knowledge and information and the learning processes.

(Dewey, 1938) interpreted the learning process as the social phenomena where it focuses on the interaction of or within the people (Säljo, 2001; Hansen, 2009; Hansen, J.E., Alvestad, M. (2018) but not the abstract concept. The other writer Ernest (1994, p.8) adds up the ideas about the human-based understanding and the socially constructed knowledge which can be dynamic with time and the social interaction to get fit into the ontological circumstances, where it does not have the actual image of it.

Vygotsky explained and explored social constructivism which adds up the theme to my research. The community plays an active role in influencing the children in their learning process and environment (Vygotsky, 1978) link with the factors that affect the children in their behaviors along with their thinking patterns. Therefore, the teaching and learning cognitive processes are a function of exchanging and coordinating mutual information acquired from the environment.

Along with that, Vygotsky also explained the zone of proximal development from the social experiences of direct learning and interactions with exemplifying the children and their parents' constructed knowledge from the society and the environment. It also meant that the information acquired by the students from the teaching and learning process from the source may result from the different learning capacities for each student since their subjective perceptions vary.

Regarding the social constructive theory, Fox also added his views regarding Vygotsky. Fox (2001) reflects that every people have their capacity and experience of learning where they still share their shared based knowledge. He also focused based on the cultural paradigm, where education as a social phenomenon is actively affected by the social and cultural aspects. In this process relating the knowledge and the socio-cultural aspects of an individual, the dynamic factors where it cannot be ideal, but it is the process of changing by time and the situation.

Within these aspects, the constructivist views based on Vygotsky, (Driscoll, 2000) reflects the information, and the experiences can only exist inside the human imagination where the learners will continually attempt to create their unique conceptual image of the real world through that impressions regarding the world where it does not need to be blend in such world. Thus, when each of the new knowledge is interpreted, learners constantly change and upgrade their conceptual templates and models to incorporate and reflect the new details and thereby create a personal perception of reality.

The theory of constructivist learning is based on a broad range of student-centered learning and instructional strategies. In this learning process, there occurs a contrast in the conventional education methods where the information and knowledge were received and conveyed to the students with passive inputs and expertise from the teachers.

Constructivism encourages a feeling of self-responsibility as students are motivated in their research and review.

### **3.3.1 Zone of Proximal Development**

This concept is propounded by Vygotsky. In this concept, Vygotsky (1978, p. 86) defines the zone of proximal development relating to the social constructivism theory that the distance between the prior development of an individual and the potential growth regarding that person under the active guidelines or social interaction between the potential peers.

For the proper development, the students should be taught in the zone of proximal development. In this process, the teachers or the guide uses the technologies and the tools, and other knowledge and methods that raise the potentiality of the students from one zone to another. With this research, the use of ICT in the teaching and the learning process, the actual situation of the students, and the use of digital technology for their teaching and learning

process could move the students in ZPD. The main theme is to clarify the research with this theory.

To get a better understand, the figure shows Vygotsky's zone of proximal development.

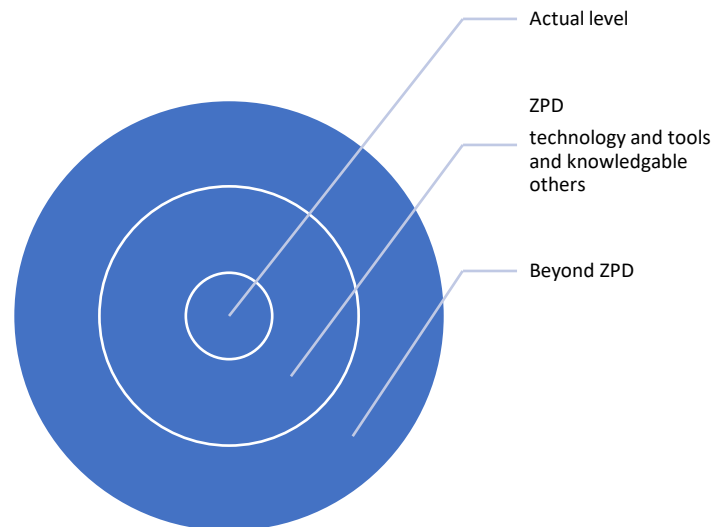


Figure 2 Zone of proximal development by Vygotsky.

**Actual Level:** It is the first step that Vygotsky explains about any individual social construct. In this zone, it shows the actual level of understanding or prior knowledge.

The first stage may be considered the real level of growth, which is a level of performance of the mental processes of the infant that has been developed after such cognitive phases are also accomplished (Vygotsky, 1978, p. 85). By measuring, we therefore always work with the real stage of maturity as we assess the age of the infant. It's commonly believed that the only things children can do about themselves are the evidence of social capacity in tests of mental development(ibid).

**Zone of Proximal Development:** In the second zone, this is the changes that Vygotsky highlighted to reflect the progress or the development in the individual after under the guidelines of the facilitators and the mentors. Vygotsky exemplifies that psychologists and educators are presented with a proximal development zone tool to consider the internal direction of development. With this approach, not just the accomplished cycles and maturation stages take place, but also the processes are still information that only begins to grow and evolve, can be taken into account (Vygotsky, 1978, p. 87). This stage also helps one to identify

the near future of the children and their complex state of development, which allows for not just what has already been accomplished, but also what was achieved since their advancement. Taking as an example, the two children with the same mental age from the standpoint of the development cycle, but these two were different in their development dynamics (ibid.). Furthermore, only by clarifying the two stages will the situation of a child's mental development be determined: the actual stage of development and the zone of proximal development.

Generalizing the concept that any individual can be in the ZPD getting active supports from the teachers or capable peers. In this zone, the factors that played vital roles are the technologies, methods, and techniques, scaffolding the students, and sharing of the knowledge about the desired field.

These two zones are the core parts of the zone of proximal development.

### **3.4 Teaching approaches in the classroom**

In the teaching and learning approaches, the ZPD clarifies the development of the children with the digital literacy medium. The teacher's first step of duty is to create a constructive problem-solving atmosphere where the students involve and interact in the learning process. With this view, the teacher represents as a learning facilitator to an instructor to familiar with the system. Oliver (2000) illustrated that the teacher ensures that they acknowledge the pre-existing opinions of the students and leads the activities to guide them and resolve their issues in this method. Teachers are the guidelines to the students where they mark their effort into the effective teaching process.

Copple & Bredekamp (2009) suggested one of the methods and techniques to boost the children's performance level by the help of scaffolding as the effective teaching and learning method which supports the children to adapt constantly and adjust to increase the level of success. In the classroom, when the teachers in their teaching process use such methods by giving feedbacks, clues, hints, the content, or task adapting materials or teaching such activities then the abilities formation occurs in the learning methods.

Regarding the constructivist features with their teaching and the learning environment, Tam (2000) classified constructivist classroom into four parts which highlight the social interaction

and the exchange of the information within the teacher and students; division of authority; teachers as the mentors or instruction and a minimal number of diverse students.

Furthermore, Tam (2000) point out the facts about the constructivist as it is worthwhile to undertake the student topics related to queries; the learning process is interactive drawing upon the experiment of the student; study focused; the teachers speak to students to help the students to develop their awareness as the active learning and role of the teacher in the negotiating process is interactive; the students are targeted to work in a group.

Reflecting the social constructivist theory on the teaching and the learning perspectives, further details might explain much of the relationship between the research and the theory. This research, exploring the using digital literacy for the students in their learning process and with the teacher teaching approaches linking up with social constructivism. This is a very crucial theme about the knowledge of the school students and differences after the teacher's guidelines or the capable peers under the circumstances teaching with the medium of ICT. For this research, the best part is that the school children were the participants involved in such study as the primary concern and effective in this activity.

### **3.5 ICT collaboration in the classroom**

Researching the government schools of Nepal, (Alam, 2016) highlights the utilization of digital teaching growth and ICT incorporation can be accomplished in the education system. Introducing Wi-Fi technology has helped to establish a high-level training environment in which students would be able to acquire obligations and navigate the content materials easily. As per Vygotsky, for the development of the child to grow and to reach the proximal zone the factors that aid is also the digital literacy to which an individual with such technologies the learning capacities can be broader. The technologies are not just affecting our everyday routines, but they will also hamper the thinking and learning patterns and take the environment to the early times, not to the modern time.

### **3.6 Teacher's pedagogy**

For this study, teachers play a vital role to facilitate the students in the academic area. The minimum qualification required to get nominated from the national bodies, along with that, the teachers should have ideas and concepts to clarify the students about the teaching methods. The pedagogical goals set by Honebein(1996) sum up the points that the teacher focusing in



the teaching to have expertise in building the awareness so that the students can decide how they can learn. Appreciation and recognition for the different views and experiences can also integrate the learning process into the practical situation. Encouraging to foster possession and putting the voice in the pursuit of learning with incorporating the social learning motivates and focuses to the core of the students learning. Vygotsky in his theory prioritized student learning in which highlighted the techniques and the methods used in the teaching process. Within it, to motivate the learning process, teachers facilitate using multiple types of representation such as audio, video, text. Different scholars like Lave and Wenger (1991) also add up their views on Vygotsky's theory of the learning process where they focused on the social structures for its learning process.

Brooks & Brooks in his book 'The case of Constructivist Classrooms' focused on the teacher searching of the student's views, thoughts, and understanding to refine the student's qualities and their capabilities by establishing the habit of raising the queries, presenting new techniques and methods, engaging and encouraging for their views regarding their learning process.

With these aspects, (Brooks & Brooks, 1993) presented principles for enriching the constructivist classroom, which helps the teachers quest for and assessment of the opinions about the student's perceptions and views and understanding the students' knowledge of the principles (ibid., p. 107).

The effective and inspiring classroom activities motives and promotes presenting emerging challenges for the students. Try to seek to develop the initial responses of the students. Practical interactions leading to inconsistencies in their prior hypothesis and facilitate debates to the students (ibid., p111- 112).

The teachers play an active role in imposing the relevance of the students and provide guidelines that boost the learners for their creativity. Promoting and recognizing individuality and initiate the learners and engage them in the interaction process (ibid., p. 103- 108).

Clearing the primary concepts and ideas of the academic curricula to the students and help them to figure out the in-depth ideas and when using the cognitive terms, apply the words like classify, evaluate, create, and predict that helps the learners to express their responses properly.

Foster's student studies by answering the deliberate and open-ended questions along with inspiring them to raise the questions to each other (ibid., p.104- 110).

By that, it's vital to promote understand the method of knowledge building for insights.

### **3.7 Students & digital learning**

Viewing the students with their childhood does not make any impact rather interacting with them and promote them to involve in developmental activities of the community. As we observe the progress of the children of Europe and the Nordic countries and their knowledge and discourses. The old models and the perspectives that represent child development is going away and new concepts and theories are emerging highlighting children's rights (Woodhead, 2005; Woodhead & Faulkner (2008). In this study, the students focused on digital literacy today and how the schools play a vital role in their development.

Digital literacy and the student's participants and learning through the medium of ICT has become the accepted term and discussed and debate about the digital childhood (Frønes & Haldar, 1998; Endestad, Brandtzæg, Heim, Torgersen & Kaare, 2004; Hansen, 2009, p. 12) and that was hampering and affecting the children and their culture due to these modern technologies. The children from the Western world are more likely to grow up with the technologies as the "digital natives" and the children who are grown-ups and met the digital technologies were considered as the "digital immigrants" (Prensky, 2001; Hansen, 2009).

In Vygotsky's theory of social constructivism, he focused term 'Mediation' the main term that elaborates the human skills and abilities that needs to create a new dimension to distinguish between human beings when animals where human learning is continuous (Hansen, 2009). The new ideas and knowledge are built upon the prior knowledge and it goes on and on. The use of the technologies not only changes daily human activities but also changes their behavior and the pattern of thinking and learning new things. Digital literacy makes human beings more unique and knowledgeable. With the usage of ICT, the children are getting more effective techniques and learning patterns (Prensky, 2001; Hansen, 2009. P. 22) which makes them more efficient and better with per generations ahead.

Data extracted from the Central Beaurau Statistics (CBS) that the population of Nepal using Internet services has been tremendously less in comparison to other developing countries.

Internet usage increased to 14% in 2014 whereas the usage of mobile phones in rural and urban areas were 60% and 80% respectively (Carm & Acharya,2016). The report of the Nepal Telecommunication Authority also presented the data that indicated the rise in the use of internet services were in 2016, 50.11% of the total population were using the internet services whereas, in 2017, about 58.72% of the entire people used the internet services. The increase with such ratio showed due to the use of mobile data which counts as expensive in Nepal and many people can hardly effort it (Rana,2018). With this data, we can imagine the internet use per child in Nepal and the situation of digital status over the teaching and the learning process. The history of ICT does not have a long history in Nepal, but the government of Nepal and the international policies have been implemented to raise the use of technology in teaching and the learning process.

Also, with the data extracted from the Statistics of Norway(2008a), 98% of the households that reach with the children using the computer and the internet access. It's not for comparison purposes but an effective method to present the children's learning process. As reflected by Carm in her studies, the situation of digital technology in the school's curricula in recent years has not been begun even despite it giving more emphasis on the policies and the strategies by the Government of Nepal(ibid.). The study of the international policies regarding the ICT shows the gap between developed and developing countries. With such studies, it can provide how the developed countries implemented the ICT and the structure and the framework to transform the traditional pedagogy to the modern pattern (Rana,2018) and their learning process for effectively implement the government policies in the education system of Nepal.

The government of Nepal (Ministry of Education: 2010a) included Information and Communication Technology in basic education. The GON also targeted to have the education through the child-centered education and developed the objectives that summarize to develop the life skills such as problem-solving, creative thinking.

### **3.8 Schools with digital literacy**

In this 21<sup>st</sup> century, children are part of this digital world (Frønes & older, 1998; Prensky, 2001; Hansen, 2009). The children regarding this generation are more likely the different learners than the previous ones which have been brought up in this technology era.

Viewing the quantitative data of the schools and the facts given by the Government of Nepal's report, it showed that there were altogether 32,130 primary schools in Nepal (DoE, 2009/10) within the primary schools there were 27,028 community and 4,627 were institutional schools. Although there were 11,341 Lower Secondary schools within which the community schools were 8,449 and institutional schools were 2,892.

The UNESCO Institute of Statistics (2012), states that in the schools of Nepal, electricity is used and that is linked to 6 percent to the primary and 24 percent to secondary schools. Even though Nepal is rich in water resources, but the hydropower plants were not able to produce electricity or any other factors that are affecting the country to move towards the development process. Along with that, the Internet linked from 1% uses in primary and 6% to the secondary schools. Computer-based teaching is used only by 0.5% of elementary schools and 4% by secondary schools (NIRT, 2016). These data indicate that it takes a while to close the digital divide.

The Government of Nepal formulated the policy documents that have specifically adopted digital literacy in the early stage where it can be shown by the National Curriculum Framework for School Education, 2005 where Nepal presented the first official document that included ICT as a medium for the teaching and the learning process (Rana,2018). The first documents were only published but did not effectively implement at the lower level. Afterward, the reformed documents published of National Curriculum Framework for School Education, 2007, the GON has involved with the different projects and to the organizations for integration of ICT in the education on Nepal. Then, Nepal drafted the first policy with ICT in Education Master Plan, 2013- 2017 focuses on developing the infrastructures such as internet, skilled human resources, and the system approaching the education but did not highlight and generalize how to implement the policies. Finally, in 2015, the Government of Nepal conducted policies with ICT policy integrating the Government and collaborating the public-private venture to develop the ICT infrastructure in the government schools of Nepal(ibid.)

We can understand why digital literacy is not effective in the teaching and the learning process. Only in the few hands have the resources that can use the electricity and the internet facilities. Even the factor that hampers the children's uses of ICT, the adults restrict the children to use the computers as mentioned by Bølgan (2006) in the classrooms or the houses.

### **3.9 Five stages of Technology Integration**

As concerns about the collaborating the ICT in the teaching and the learning process, Gladhart (2001), a Levels of Adoption Model by adapting the Apple Classrooms of Tomorrow (ACOT) which were studied by Dwyer, Ringstaff, and Sandholtz (1992). This model highlights the issues related to the teachers' and students' behaviors along with the tools and technology integration. These behaviors are categorized into the five stages with the five stages of the computer technology integration, and they are:

#### **3.9.1 Entry**

This is the first stage of the learner and these are not the teachers. In this stage, the learners are trained to utilize the ICT. In this part, the students acquire ideas and information with the help of ICT settings in the schools. This is the primary stage for the student to gain insight about the tools and the technologies with the observation or by themselves.

#### **3.9.2 Adoption**

The teachers are in the stage and they use the tools and the technologies that are supplementary supports for their manual teaching methods in a limited aspect. The government provides the teachers training and programs that are for the sake of their teaching skills. Utilizing the ideas in the administration works, teachers personal work. In this part, teachers also encourage the students to use and mobilize their ICT skills in their teaching and learning process.

#### **3.9.3 Adaption**

This is the third stage where the teachers mobilize their skills of ICT in the classroom and its activities. With such phenomena, the teachers add up the study-related materials, but their teaching techniques would be the same. For information searching, they use online methods from the internet, compact disc, e-learning materials, etc. where they integrate more with digital learning than the traditional ones. The teachers keep their teaching practice as previous one.

#### **3.9.4 Appropriation**

The teachers start recognizing their skills and qualities and trying to build projects pre-eminent within their prospects by the opportunities offered by information and communication technology. The learners also continue their learning integrating the ICT tools and techniques

to achieve their goals with high intelligence. The ICT and the technologies that are used in such teaching and learning processes a valuable means of tools.

### **3.9.5 Invention**

In this stage, the teachers continue to modify their teaching and learning methods by using the technology during their courses whereas the students also mobilize their fundamental and higher skills and qualities in the digital learning procedure.

## **3.10 Learning Theories and ICT implementation**

Learning theory describes the different perspectives of the students to gather, perceive and retain information and knowledge within the learning process. In this process, an individual influenced the different socio-cultural, emotional, and environmental aspects in collaboration with the actual knowledge they constructed to play a vital role in understanding the whole issues related to change in the system.

Within all the learning theories, constructivism within various themes regarding active learning, discovery learning, or the building up the knowledge which focuses on the children learning freedom within the system. Hill et al (2004:443, 448) developed different views regarding the learning theory that an individual uses digital technology in classifying in three different methods. The learning methods in the learning theory determine the medium as with, from, and through aspects. Furthermore, it has been discussed in detail.

The first category defines the learning from the method that explains the transmission of the information and the data to students with some media (Piaget 1954; in Hill et al 2004). Vygotsky also highlighted the zone of proximal development where the students get support and help from the teachers to reach and change their status from their actual knowledge and their constructed knowledge. Here in this view, the teachers play the role of the facilitator and transfer of knowledge to the students.

The second part explains the learning with a perspective where the learning process is regarded as passive and focuses on the active creation of the learners( *ibid*). The active learning process from perspective is a sign of knowledge between the teachers and learners (Perkins, 1986; Hill et al 2004).

The last category defines learning through methods where the conversation occurs between the students and the teachers through digital technology. Furthermore, (Hill, 2004; Selwyn, 2007) highlighted the creation of the learning procedures and experience generated with the online medium. The progress on digital literacy and the students learning are increasing with the progress of Nepal's population using internet services even though it is low in the quantitative data, but it will consume time to reach the ideal phase.

### **3.11 Summary**

In retrospect, the social constructivism theory is the best tool used for the descriptive method that fits in this qualitative research that explained the use of ICT in government schools. In this research, the research theory was based on the Western philosophy that Lev Vygotsky developed and tried to explore the theory in developing countries. For this study the theory and its elements related to the context, it is applicable. With its pros and cons, the learning theory also gives a guide to the context for this research. Explaining the research that connects to the government schools which focuses on the digital teaching and learning of the students.

This idea demonstrates succinctly how modern technology comes from and attracts the masses' recognition and use. Although, the research highlighted the recognition that other considerations play an important part in the mechanism of introducing the constructivist theory. The structure of the zone of proximal development and the factors affecting these areas need to have suitable mechanisms following the ICT framework. Without it, the system fluctuates with such conditions that the coordination of digital literacy becomes a challenging effort. The information and the ideas of the pedagogical requirements of digital technology and tools users mentioned in the literature review, observational evidence indicates that the teachers teaching methods are substantially liked to an individual learning capacity.

## **CHAPTER IV: RESEARCH METHODOLOGY**

### **4.1 Introduction**

This chapter highlights the research methods which were further applied to conduct analysis. This research is about exploring the use of ICT in the government schools of Nepal which focuses on the study area. In this research, it is still under-researched which further needs to study the policies of the government and amendments to the government schools of Nepal.

In this research, different units are covered to get a better understanding of the research design, rationale of the study, population selection and sampling and its procedures, data collection tools, techniques, and the instruments with its procedures. It also focuses on the qualitative research methodology to obtain the data and information which further supports to find the findings of this research. Ethical consideration was also very essential if keeps the research in shape.

### **4.2 The rationale of the Study**

The research area for this study is Pokhara Metropolitan City in the Himalayan country of Nepal which is selected for the convenience of the researcher and has more time to observe the school settings, and which lies in South Asia. “Pokhari” in Nepali means a lake or loch and Pokhara derives its name from the seven lakes in the region. The beautiful city of Pokhara is the provincial capital of Gandaki Province and headquarter of Kaski District. It is located 28-degree 10 north to 28 degrees 16 north latitude and 83.58.30 to 84.02.30 east longitude. It is located between 800 and 1,800 meters above sea level in the southern and northern parts. Kathmandu Metropolitan City, i.e., the capital city, is approximately 200 kilometers west of the Pokhara city. It has the second largest population after Kathmandu. It is to be noted that Pokhara is the largest metropolitan city in Nepal, in terms of its area, occupying 464.24 square km, nine times larger than Kathmandu and 18 times larger than Lalitpur. The researcher himself is originally from Pokhara. This makes data collection easier. The study areas are in Pokhara, Sarangkot, and Pokhara- 6, Lake Side. Sarangkot is a rural area and Lake Side is an urban area. The researcher decided to include one school each from these areas.



### **4.3 Interpretative Paradigm**

For this research, I decided to present the social natural settings (Rana, 2018, p.83) of the respondents for investigating and exploring the research theme-based objectives in the targeted areas to find the different views of the participants such as teachers and students. For this study, I noted down the ICT infrastructures availability in the researched areas and their thoughts about the ICT settings in the schools. Although this study gives more emphasis on human-based views and experiences regarding the thematic analysis of the research falls under the interpretative paradigm. The research can be interpretative (Klein & Myers, 1999) if the information, awareness about reality is acquired from the social encounters and construction methods such as consciousness, perceptions, etc. Furthermore, with this study, I focused more on the social interactions with the participants to gain many sources of the data which was vital for this research.

With this study, I was aware that the interpretative paradigm includes the subjective experiences and views what the social beings express about the study where this paradigm does not pre-define any findings or any variables on which it depends or not (Kalpan & Maxwell, 1994) but it reflects on the dynamics of sensualizing according to the situation. By following this study, policies and laws which are the policy documents of the government are relying on this research for using Information and Communication Technology in the government schools of Nepal related to the global situation. Therefore, I gain valuable insight into the meaning of ICT in the schools by analyzing policy documents and reading the views, thoughts of the people of the global insights into the national level policies that were implemented and highlighted by the Ministry of Education for the effective education system. Although, policy documents were prioritized along with the interpretation of the participants' behaviors, views, and experiences within the ICT settings in the teaching and learning methods to utilize the ICT on a further basis.

Along with this process, I prepare the semi-structured interviews to gain insight into teachers experiences and their teaching methods for upbringing the students' expectations and observe directly and indirectly the school environment and their technology uses in their classroom which further provides the information and data that can be useful in the data analysis.

#### **4.4 Research design**

The research design refers to the overarching approach that is determined to combine the different components of the research in a cohesive way to ensure the study is effective to obtain the answer to the research problems. Research design as Bryman (2008) emphasized on the framework with the data collection and analyzing it. It is also accompanied with a research design, which is a study plan with suitable structures and techniques for revising research questions, issues, and their answers. Burns and Grove (2001), provides the blueprint for the data collection and processing, interpretation, and the calculation of the findings with its validity to control over variables that would hamper the results of the research. It is the process that helps the researcher to focus on their goals by the methods of planning and implementing the research agendas. With its significant roles, it helps to increase its efficiency within its research areas.

In this chapter, there has been used observation as well as descriptive research design. To make it easy, the observation method gives a clear vision of the environment and the settings of the schools for this research. With this method, the first impression designs the part of the research. In this study, the qualitative research design plays a significant role to dig out the social reality as constructed in the natural settings (Cresswell, 2014). The social constructivism paradigm (Gall, gall & Borg, 2007:21) makes a better understanding for the people about the social settings in a real aspect which further focuses on the social phenomena.

In this chapter, the descriptive method is also used to collect information on the school settings and the teaching and learning procedures through the ICT settings in Nepal. This is the method that reports the outcomes of this research. Descriptive pattern enables the researchers to observe and express the behaviors without having the critical study and investigating the correlation between the different variables of cause and the effect within which the observing, case studies, focus groups are the methods that are commonly used in this method. It is very much preferred to use in the research to collect the data from the teachers and students in their natural settings, their views, and expressions regarding the study. This method can be used in both quantitative and qualitative methods. By using this method, it will be very much convenient to conduct within the limited number of people to generalize the findings of the sample population.

The purpose of this study is to gain a better understanding and explore digital literacy in formal education which is also the need of today's world. The use of ICT in education has made it easy for the teachers and for the students to understand the subject they are learning. E-learning, or a virtual learning condition, has made a common working space and assets, simple access to late data, the advancement of community-oriented learning, and created diverse methodologies for instructing and learning. The advancement of the web has pulled the present age of students towards an online slate where they can have live communication while sitting in different areas around the globe. Students can share thoughts utilizing audio video talk or live chat.

#### **4.5 Qualitative Study**

This study uses Qualitative Methods intending to examine the experiences of teachers and students regarding the use of ICT in schools. (Cohen, 2007: p. 461) highlights the qualitative research methods constitute of organizing the data, accounting for, and explaining the data where its emphasis on the respondents' environment and their settings, note-taking pattern, the research themes. It also selects the data and categorized the data for their uniformity. A qualitative method was used to capture expressive information not conveyed in quantitative data about beliefs, values, feelings, and motivations that underlie behaviors within their classrooms with the help of interviews and observations (Neuman, 2006). The researcher decided to use this to learn directly from respondents and to provide the context necessary to understand quantitative findings in greater detail.

As per the qualitative nature of this study, primary data is gathered through a semi-structured interview to keep more of an open-ended about the desired contours needs to know about, so that concept and theory emerge out of the data (Bryman, 2012: 12). The purposive sampling technique will be used for qualitative study which will also be explained below to get the full view of the sample selection. With an understanding of qualitative research, this study will be utilized semi-structured questionnaires, followed by related questions to get in-depth answers from the respondents with various themes to be explored (see Appendix- 1). The data which will be obtained from the observation will be coded and categorized according to the requirement. In the case of qualitative information, data will be analyzed descriptively. They were thematic, i.e., themes generated by data. The themes will be further classified into sub-themes that had the same meaning-making approach. Qualitative data analysis will be carried out simultaneously with data collection.

#### **4.5.1 Case Study**

For this research, a case study was done to glance intensive analysis of the single unit of the study. With this study, it is possible to reach high-quality data and can see the variance of the study. The case study is applied to the government schools of Nepal that are instructed in the ICT settings in the teaching and the learning process. For this research, I have done observational methods to visualize the settings of the schools and the teaching methods in that school. This study helps me to get a better understanding of the national policies that aim to help the schools with their teaching methods and the learning procedures of the children. As Denzin and Lincoln (2011) highlight on the settings of the environment that regards in the context can only be specified in the place and the time to extract the information about the situation.

For the data sources clarify by the example as the psychologists carried out the case study to get the data by the help of observation of their client's routine by taking notes and with the interview methods to get to know their feelings, experiences about themselves and get to know more about them by using the official documents, likewise similar perspectives used in this research. From such study, the researcher tried to gather the information regarding the teacher's activities, their responses related to their experiences, perceptions (Lichtman, 2013) whereas also to the student's responses and their learning procedures which helped the researcher to integrate the various research areas to get the depth study.

#### **4.5.2 Selection and Sampling**

In this chapter, the very important aspects regarding using the proper methods of sampling and selecting the sample to make the research more efficient. For this study, purposive non-probability sampling is the best suitable technique as it has significant variables, homogeneity in the sample, which would be cost-effective, can be done in a short period. Regarding all these benefits, it also represents the overall population. Cohen, (2007, p 114) qualitative research where the researchers pick the cases to be included in this type of sampling based on their judgment of their typicality or possession of the characteristics being sought. As Bryman (2012: 418) mentioned in his book, samples in this study are selected strategically according to the relevancy of the research question because "the purposive sampling aims to acquire the sample cases/participants strategically so that those selected samples are relevant to the research questions that are posed for" (Bryman, 2016, p. 408) where the selected sample will

be done in the governmental schools in Nepal. This nonprobability sampling use in this research is frequently used in small-scale research (Cohen, et.al. 2007, p 113). It was selected with few schools where one of the studies that can be effectively used can be the case study which can provide more information.

For the selection, I chose that schools and teachers where I can observe the school settings frequently and can observe the teaching and learning methods where I can quote the related context and teaching activities of the teachers with the observation method. Among the numerous schools in the Kaski districts, I did the sampling method with two different geographical areas within the same zone, but one is nearby the city, and another her one is a bit further than the previous school their selection of the students and the teachers in these schools are low in number in compared to private schools. With also the ethical context, I had to study a clear environment that I can see the relationship between observation and the ICT settings.

#### **4.5.3 Selection of Schools**

The schools I selected are two different schools which are government-run which is in Pokhara Metropolitan City which are Alpha and Beta School that I put an imaginary name as AS and BS respectively in Kaski district, Nepal where it lies in the Western region of Nepal. It has its moments and its settings. One is different from another in terms of the location, economic factors, socio-cultural settings. Both schools are within the Metropolitan city but in different Wards with different geographical heights. In these schools, teachers are appointed by the government. Both schools' main language of instruction is Nepali, but the course materials are in English except for some subjects like Nepali. The researcher observes the schools in understand the settings of the schools and the ICT setting in the schools and their teaching and learning. With the interaction with the Head of schools, different NGOs and INGOs projects were launched timely to uplift the school's assets like computers, stationery materials, etc. which helped them a lot to go with the technology setting computer labs in the schools.

#### 4.5.4 Respondents selections

For the respondents' selection, Gay and Airasian (2004) reflect on the attribute that the descriptive survey analysis is suitable for sample sizes between 10 and 20 percent of the total population. Therefore, selecting the participants from two schools, I selected total 8 respondents from two schools named as Alfa School (AS) and Beta School (BS) and their students as mentioned in the chart as the gender perspectives, subject teacher from each school, and the headteacher. So altogether, there were 8 respondents for the interviews. The researcher also got an opportunity that the schools were started with the computer labs and started to teach their students with their settings.

For the selection of the teacher, I interviewed two subject teachers which are teaching the selected participants in both Alpha and Beta schools. There were limited teachers in both schools which I selected gender perspectives but with no boundaries of criteria. Teachers are directly nominated by the educational bodies of the government with their minimum criteria. The Headteacher at each school is interested to see my research topics and they permitted without which it is not possible to conduct any means of research. They organized the meeting with their staff and teachers to research which support the researcher for the depth study.

The table presenting the name of the schools and the name of the students as well as teachers and Headteachers as the image name to keep are as follows.

<b>Schools</b>	<b>Participants</b>	<b>Gender</b>
Alfa School (AS)	Student 1 (A1)	Male
	Student 2 (A2)	Female
	Teacher (AT)	Female
	Headteacher (AH)	Male
Beta School (BS)	Student 1(B1)	Female
	Student 2 (B2)	Female

Teacher (BT)	Male
Headteacher (BH)	Female

## **4.6 Sources of Data**

In any of the research, collecting any sort of data and information plays a vital role in the statistical analysis where the sources of the data fall under or are very much dependent on primary and secondary data (Douglas, 2015). Furthermore, it can also be called the bank of the data. In this research, both the sources of data contributed to have qualitative research design and findings of this research.

### **4.6.1 Primary Data**

The primary data are data that a researcher gathers first-hand information (Kothari, 2004) using techniques such as surveys, interviews or observation, or any other ways from a private source focusing the theme of the research. In this study, the primary data were collected from the methods and the instruments of observation, interviews with the respondents like students, teachers, and observing the researched environment.

#### **4.6.1.1 Observation**

Observation (Morrison 1993; Cohen, 2007, p. 396) enable the researchers to collect the data from the various factors that are highlighted as from the physical environment with its surroundings; the human characteristics where the people being observed; the interactional settings where the interactions are formal, informal, in planned or unplanned settings and the program settings which focuses on the resources with their organization, teaching techniques, curriculum with their organization. Observation offers an observer the opportunity and chances to collect live and primary data from naturally occurring situations of the targeted environment. It is a powerful tool for obtaining insight into situations (Cohen et al., 2007). For this study, observation will be the major tool for the collection of data. In this research, the participants' observation has been conducted to obtain both information about the teachers using the ICT methods and practices in the classroom settings (Cohen, Manion and Morrison, 2011) and

within which there will be the selected number of students in the selected class with the specific subject.

Observation data can be very useful for collecting nonverbal behavior that is in natural or contrived settings. Observations can be conducted for both oral and visual data (Erickson 1992: 209- 210; Cohen, 2007, p. 407) clarifies that the researcher observes the environment and write down the details in their notes when a powerful recording device through audio and video recording. Furthermore, for the data collection, audio, and video data which has the trendiness of analysis and the research materials. But while doing the audio and video data, one has to be very careful to take the information while installing the recording device.

However, it provides basic information to complement the ideas elicited from the interviews concerning using of educational technology in teaching and learning activities in the given context of the government schools in Nepal. The main aspects of this process are to dig out the relevant information about the students, teachers, and school settings in the class with the use of ICT.

Participant observation can be conducted and required to study the small number of groups or events that deserve the short time or that might be frequent in times of observing the events, (Cohen. Et. al., 2007) where the basic interests in collecting the data and information from the contemporary situation of the research themes and areas which is also the descriptive research design.

During the face-to-face interview, the researcher observed study subjects and took information conveyed through language and behavior in their natural settings. The researcher acted as a 'participant-observer who asked specific questions to the study subjects, writing 'field notes' that detailed what he saw and heard and organized his observations around categories. The researcher interviewed subjects with the specific objectives in mind: to learn from well-positioned individuals (key informants) who can provide useful information; to understand experiences especially important to shaping perceptions and decisions (critical incidents). The field data were analyzed with a meaning-making approach. For the research, observation plays an active role to make the research more effective and efficient to dig out the findings of the research.



For this research, I took a note about what I observed direct and indirect methods while in the school environment and in the classroom when teachers are teaching and even in their vacant time. With the consent of the school authorities, I was able to ask the relevant questions I had about the research, and they were really helpful.

#### **4.6.1.2 Interview**

For this research, interview methods give wide areas for the participants to express their views and thoughts. An interview guide is made covering the specific topic of academic standard and deals flexibly to flow the rhythm of the response to the semi-structured interview is supposed to reveal descriptive, informative, and more insightful findings for this study.

The main source of the data collection to which the researcher interviews the participants along with the teachers and the headteachers using the different formats of the question settings. Along with this, I have chosen the semi-structured interview as mentioned in the purposive sampling. It is a widely used instrument in qualitative research which offers open and explanatory inquiry in the field of study. It emphasizes greater generality in the formulation of the initial research idea. Bryman (2012: 471) writes, unstructured and semi-structured interviews are often referred to collectively as a qualitative or in-depth interview. Semi-structured interviews consist of both the structured and the unstructured interview patterns where it can have the advantages of both methods. A semi-structured interview, where an interviewer asks a few questions while the rest are not planned previously to get more depth information. It makes it easier to critically compare candidates and encourages them to discuss the related subjects of the individual candidate randomly. This is highly flexible and may not be bound to follow a specific schedule, often rambling to cover rich detailed answers.

During the face-to-face interview, the researcher observed study subjects and took information conveyed through language and behavior in their natural settings, (Kothari, 2004) exemplifies the method as the face-to-face dialogue in a formal manner between the two or more people to interact and produce the information. In this research, formal questions were asked to the interviewee about the theme of the research on a mutual basis. For this research, the researcher gathers the information having the oral dialogue to the teachers and the students related to the using the ICT in the Government schools in Nepal where the interaction occurred with the semi-structured interviews for generating the data.

I took the interview of the 8 respondents from both the government schools with the teachers and the headteacher at that school. The interview covered the different sets of questions to the students, teachers, and headteachers. The students were asked more about the ICT settings in schools and how is their progress in their studies. The subject teachers were also asked about the ICT in teaching modes, their experiences regarding the ICT, and the headteacher was also asked about the overall school ICT settings, experiences, policies implemented to the school and the government support to the ICT in government schools.

#### **4.6.2 Secondary data**

Secondary data are the data that a researcher obtained not from the primary source, (Kothari, 2004) but the published sources likewise as studies, books, surveys, journals, or published articles that have been published or used by other people or any organization for their publication. For this research, secondary data were obtained from different books, articles, journals, published research, or official reports which were collected through the primary sources to which research can use the data conveniently for their study. Following are the secondary data that made the research more valuable and fruitful.

##### **4.6.2.1 Documents**

For this research, qualitative secondary data has been used to get more insight into the policies and rules, and regulations of the Government of Nepal and for the education system. Any data that has been published in any form that might be audio, visual, or written. They have a huge variety of data and they are also regarded as historical records. Secondary data consists of the government policies, laws, reports, newspapers, novels, books, letters, diaries, pictures, radio, or television as their information (Cohen et. al., 2007, p. 194) which can be primary sources as if they were not published or used before. These data can be very useful in every research as they are the pillars of the research.

For this research, I have used many documents that were provided by the government of Nepal regarding the Ministries of Nepal related to Education, the Department of Education, and different bodies that were related to it. Before going to the field, I collected all the possible

official documents related to government policies and laws related to my research theme. With the respondents, I have shared my research theme to understand their school official publications and their policies regarding my theme of research which might be very essential for my study.

The secondary data used in my research are as follows:

**Official Documents:** The government of Nepal has published various books, reports, journals, research reports, etc. regarding public use and information. Within which there have been used different official reports of Central Bureau Statistics of different published reports, and many other reports that provides much information related to this research.

**Personal and published Documents:** While doing the observation in the researched schools and the classroom and the environment by taking pictures, notes to what was seen and heard and that was related to the research it helped a lot in collecting various information as this information is the first-hand data and with the personal opinions related to the feelings and experiences. With the secondary data, there were also some notes related to schools and the information which were needed for this study.

#### **4.7 Audio notes transcribing**

The audio recording was done in English even though the official language is Nepali. With the discussion about the medium of language, the school authority suggested me do in English with their students and colleagues agreement. While taking the interviews to the participants about the research questions and issues related to it then I had to take several unofficial interviews.

Along with that, I also printed the questions that I was about to ask and give them to make it easier. All the participants may not be fluent in expressing but they might be good at writing their expressions which finds a good method to collect the data for my research. Audiotaping these interactions helped guarantee that expressive data were captured accurately and completely as they emerged. Taping also permitted the researcher to carry the data to more controlled settings, where they could be transcribed, coded, and analyzed for important themes and meanings. With the privacy of such recordings, I promised them to delete that information after noting down for my research and provide them a copy of my research for ethical issues.

## **4.8 Ethical Consideration: Validity and Reliability**

Validity and reliability are very essential factors that every research is to have to make it more ethical, trustworthy and it also increases transparency in the research. For the qualitative research, the main issue is the research findings and the results which were based on these factors valid and reliable as if the research questions asking that they are measuring what they were supposed to measure (Cohen et al., 2007: 150) to increase the trustworthiness and to make the research more valid and decrease the bias in this research.

The validity, (Bryman, 2012) is a research instrument to which the instrument measures the concept or not, (Robson,2011) research instruments are the degree that makes the results valid and truthful. Along with it, Cresswell, (2011) views the validity that the results are valid and accurate from the researcher's perspectives with the respondents, participants, or to the readers. Research validity is the degree that the criteria of the scientific methods of research were complied with during the process of creating and generating the research results where (Oliver, 2002) it is a prerequisite for all forms and types of research and studies. Validity has the internal and external aspects that make the balance between the different components within the research. Internal validity correlates strongly between the researcher observation and their theoretical ideas whereas the external validity generalized the results.

Reliability (Bryman, 2012; Creswell, 2011) is mainly concern with the research uniformity and stabilization to which its three critical aspects include stability which overtime does not fluctuate the outcome at any time( Chakrabarty, 2013), internal reliability which has the reliable degree of the indicators that comprise of a scale and the observer consistency emphasis on the accuracy of the findings (Blumberg, 2005) even though there might be multi observer engaged in the study of the research if exists are the factors that play the key roles for the reliability.

As per the research plan, before starting the interview or asking questionnaires, written consent was taken from the university stating the research ethics which guided my research from starting till the completion and finalizing the findings. Also, before starting any data collecting methods, consent was provided to all participants and the verbal ones too with the voluntary participation. For the ethical issues, I provided a consent form A to the students (written or verbal), written consent from B to the teachers and consent form C to the headteacher. Afterward, I sent the research main agendas to the headteachers at each school and explain why

I am here and what I am doing in this school. I also informed the participant the students at both schools about voluntary participation in this research. I also described to them what sorts of methods be used in this research, interviews with the written questions if one feels better in the written expression. For the research, I was more conscious about their secureness where they might feel the state of giving withdraw from the study and which was acceptable. The confidentiality of the subjects was promised to maintain. Whenever they do not want to be named, they would be included as anonymous, and their data collected will give to the respondents (Cresswell, 2014). English language would be used for data collection. In case of the subjects' difficulty, the researcher will translate English into Nepali for their convenience.

In this study, all the relevant data that was collected of the respondents regarding the protection of their knowledge are kept as evidence for testing validity and reliability. I am mindful that ethical research obligation extends beyond knowledge and confidentiality protections. If only the authenticity and credibility of this study can be proved if suspicious circumstances are produced, then the evidence can be used to guarantee the source. It also concerns participants' care and the details they share with dignity and to present the participant information, I tried genuinely to avoid bias. Besides these, no one will have parental control over the resources and cannot be violated by any other means. For this research, the researcher shall be held responsible for some kind of leak or adverse consequence of information given to or by the informants/participants.

In this research, there were given that the gaps in the study have been previously resolved, the dilemma continues to be explored and includes quite a range of considerations within the environment. With the students' and teachers' perceptions of ICT instruments and methods used in the contemporary situation. The researcher will then integrate a full variety of these considerations and will first analyze them at a slight depth. However, to incorporate the ICT resources for students and teachers, which in turn can be used for further study, then it should be possible to determine which of these considerations is relevant.

## **4.9 Summary**

In this chapter, there has been focused on the research methodology where the necessary units are covered to make a clear understanding along with the instruments to analyze further stage.

This research is qualitative where different data collecting procedures were explained. Stating with the introduction part gives brief information about the research. Research design with its importance in the research was presented. The rationale of the study covers the study areas of the research whereas highlights the qualitative methods used in this study. A case study has been used in those schools of Kaski district where the sampling and selection of the respondents were done. The methods used to collect data used in this paper are observation and participant observation, interviews to the one-to-one method as the primary sources of data. The secondary data has also been used in this research as documents and policies of the Government of Nepal. Finally, without the ethical perspective, the research cannot be fulfilled ineffective order.

## **CHAPTER V: RESEARCH FINDINGS**

### **5.1 Introduction**

In this research findings chapter, the study's main aim was to explore the use of ICT in teaching and the learning process by the teachers and the students at the government schools of Nepal. For digging out the research findings, the three research objectives are directed to the research process. The questions were intended to decide how the ICT-based settings in the schools were implemented for the teaching and the learning process by teachers and students. How digital technology played a role to enhance the education of government schools. This study also focuses on the government policies and technology in the education system in Nepal. Regarding it, it also explores the context of the policy papers and services as well as the discussions of conclusions focused on the interpretation of such documents in the education system.

For these research questions, the results will be discussed concerning these queries which centered on the collected data which was mentioned in the previous data. The information was collected and obtained from different methods like observation, interviews from the various schools in Nepal. In this study, the data were arranged in each part of the subject study by holding up the data collecting methods like the observation of the school's environment, participant observation to grasp the actual situation and the face-to-face interviews with the students and the teachers about the research theme-based queries. Within this, it analyzes and shows the data through documentation, observation, and interviews.

The results are classified according to the subject related to the research questions. Furthermore, it also analyzes the conflicting traits and tends to arise from the social constructivism view.

This chapter also highlights these research questions and discussed in them the context organized under the following parts:

- i. The understanding of how teachers collaborate the ICT in the teaching process
- ii. Examine the factors that contribute to integrate the ICT in the government schools of Nepal.
- iii. The Perceptions of Teachers and Students and the Use of ICT in the Schools.

## **5.2 The understanding of how teachers collaborate the ICT in the teaching process**

This is the first research question of this study. In this query, it is necessary to know and understand the status of ICT in the education system of Nepal along with government policies, documents that state the ICT policies in the education system. First, this research question explains about ICT was implemented or not in the Government schools in Nepal and its scenarios related to the contemporary environment. This mainly highlights the government policies and plan documents. Secondly, it will further elaborate on what programmes and policies are implemented for the ICT settings in the Government schools of Nepal. In this research question, the things quoted and highlighted by the observation and the interview methods and focusing on the governmental policies that directly have influence in the teaching and learning within the ICT settings.

### **5.2.1 Government Policies and ICT**

Discussing the government policies of Nepal lighting the use of ICT in the educational system highlights the Information and the Technology Policy, 2015 drawn from the Ministry of Education of Nepal. It describes the notes that specifically focuses on the appropriate steps taking on the promotion of the ICT and integrating through the entire education system of Nepal to support the governance, teaching and learning methods, educational research, and to set up the body that is responsible for the quality control and implementation of the qualitative education and trainings all over the nation. It also emphasizes the steps of the ICT policies implemented from the past to the current situation.

The government initiated the ICT settings in the schools but what sort of implementation has been done till now and impacted the schools teaching system. As I have presented much of its information in the literature review in the second chapter, but the major plans and policies are highlighted to light in the ICT settings in the government schools of Nepal.

### **5.2.2 Master Plan (2013- 2017)**

With the proper incorporation of ICT in the education system, the Government of Nepal highlighted the Master Plan 2013- 2017, with which a National ICT Research and Development Fund was established for government to deliver its strategies and goals for the development works. Government with such works promoting on the technology and its networks like mobile



phones and the tablets regarding the ICT domains for the government of Nepal to integrate the research programmed with the international development societies (Ministry of Information and Communication, 2015). The Ministry of Information and Communication, therefore, puts excellent focus on the technical uses of education in a more explicit manner. Consequently, the Education Master Plan 2013-2017, the Ministry of Information and Communication drafted ICT with the aid of the Ministry of Education to execute its credibility.

In addition to the ICT and its functional abilities at the tertiary level education system, it will improve so that the significant learning outcomes will increase. The prioritized objectives of the ICT policies highlight empowering the Nepalese people to participate in the 'Global Knowledge Society'. It also integrates and emphasizes to increase the intuitional capacity with the developmental infrastructures and the manpower in both public and private education systems that provides the ICT courses and digital setting in the teaching and the learning process.

Within this, the policies also include deploying ICT in all the education systems of Nepal to make quality-based performances. The policies above presented and discussed the technical use is promoted in Nepalese education. The GON documents regarding the ICT Policy-2015 are particular for the use and inclusion of ICTs in the pedagogical process in the education system.

### **5.2.3 Ministry of Education and ICT policies**

Ministry of Education has incorporated some of the ICT-related curriculums and programmes to promote the ICT and digital literacy in the education system which was emphasized in the Information and Communication Technology in Education, Master Plan 2013- 2017.

With such implementations, they were the one Laptop per Child (OLPC) which was the pilot project in some selected 26 schools in six districts in Nepal. They propounded the Lab Model projects where the computer was shared in some of the cities; Internet facilities access to the District Education Offices (DEO) and some schools with the matching funds provided and the computer labs with the internet facilities from the local providers.

AT, AH, BT, and BH from AS and BS said, *the government provision of tools for their computer labs but there are no proper internet facilities and the load shedding and the electricity suppliance not matching with the teaching time. The load shedding moreover happens in the daytime and the school runs at the same time.*

Further stated, AH and BH from AS and BS said, *the tools provided to the Government schools are there as it is, and it looks like it was just to observe the device then to use for school purposes.*

Along with that, the Ministry of Education under the Government of Nepal had launched their official websites in each Development region of five regions and the Department of Education (DOE) in all of 75 districts. Furthermore, the collaboration of some NGOs in Nepal initiated the ICT learning materials for the junior students including from the grade 2 to 6 to which the materials were based in the subjects related to Nepali, Mathematics, English, and Science.

AT from AS said, *the Government policies that initiated the ICT settings learning materials to the students for the lower level have not been publicized in any Government schools in Nepal but if they were informed then it will be better for the schools to circulate such materials to the junior students.*

Some programmes explore the Ministry of Education and the Department of Education provided technologies for the schools to brought up the schools for the proper conduction of their programmes with digital settings. As discussed in the policy documents, under the 'Education for All' programme the Nepal government implemented the Formative research Project 2004- 2009, where the Ministry of Education handed over to the 62 schools with a computer and a printer each. It has also stated that the role of NGOs played along with trust and individuals granted technological aid to some schools to have the computer skills for the teachers in their pedagogical aspects.

#### **5.2.4 The Government Schools and the ICT settings**

Within the Government schools and the ICT literacy settings in such schools started with my observation and the pedagogical uses of multimedia resources. It is very much usual to have

printed information for the parents which were not in the early times in the schools. To have better and good schools, the schools with their environment for the students for mobility, student's active participation in learning activities, along with that digital learning tools and technologies. The schools with a computer lab and teaching in the ICT setting is a plus for the teaching and learning procedures.

Along with the policy, 2013- 2017 mentioned the matching grant schemes targeted from 2007 to 2010, the Department of Education with its initiation (DOE, 2010) provided the 2 computers with 1 printer to 3030 schools in Nepal. Similarly, with such schemes, the DOE further provided internet facilities to 85 secondary schools to facilitate distance education programmes (DOE, 2012).

*AT and AH from AS mentioned, the Government provided the tools for the ICT labs for the schools but due to the internet problem and the lack of technicians that could not work smoothly.*

*BT and BH from BS said, the internet is making it so much difficult to operate even our laptops for schoolwork.*

Although, the education policy formulated by the Ministry of Education did not have integrated any such consolidated framework for using ICT in education in Nepal till 2010. Along with such magnificent aid and supports from the government to the schools and the teachers as stated in the ICT policy, 2015, ICT machinery and supports were primarily used for administrative purposes. This was because of teachers and the school's managers' inadequate ideas and knowledge about the content and the skills related to digital teaching and learning.

To have an effective policy, a systematic strategy and curriculum are to provide the students with relevant information about the ICT in education and the use of ICT to enhance teaching training practices for the teacher.

The extend of using ICT and the technological devices have much easier access to the urban schools' students while to those in the rural areas which have barely any internet facilities and services related to it, which induces a digital divide. So, the government must initiate its steps to intergrade the digital pedagogical settings in all the government schools of Nepal.

It is also stated in the report of the Asian Development Bank supporting the School Sector Development Plan (2016- 2023), which was initiated by the government to improve the quality of education which highlighted the basic and secondary education improvement and trainings and programmes delivered to each teacher from 4500 schools. The government also formulated policies for activity-based pedagogical materials for the different subjects and to collaborate and integrate ICT in the study and electronic resources to introduce to the schools and for the teachers and students to the study contents and teaching methods. The government of Nepal plans to implement an e-governance system, construction, and implementation of network facilities of the internet by installing the optical fiber grid all over Nepal for a long-term education system.

It is also a huge program that has an expenditure of \$6.46 billion which is targeting the 6.3 million students, 153, 200 teachers and around 34000 schools across the country. Many countries and donor organizations like the Government of Nepal, Asian Development Bank, Norway, Finland, European Union, World Bank, Australia, UNICEF, JICA, etc. play significant roles in the education sector of Nepal. Even though Nepal has received so much support and aid towards the education system, but the result has not come yet as we need to wait few years to get it.

### **5.2.5 E-learning Platforms**

There were many online courses like Massive Open Online Courses (MOOCs) which provide an online platform to university students around the world. In the Nepalese context, the Kathmandu University also implemented similar online courses like MOOC named as Kathmandu University Open Online Courses (KUOOCs) where the university put up their materials in e-learning applications which are free and open to all and from anywhere people can take the needed materials. Along with such online courses, the university also established an e-learning application name `MOOC for Higher Education in Nepal´ which was helped by different countries and donor organizations like Canada, IDRC, FIT- ED Philippines to encourage a Nepalese e-learning environment.

The A1, A2, B1, and B2 from AS and BS said, *we do not know about e-learning platforms as if we need to find anything then we use the Google search engine at home.*

A1 and B2 from AS and BS said, *we have learned to use Google from our family members or friends.*

AT and BT from AS and BS said, *the MOOCs application as we heard about it, but we have not used it till now. But it will be better if the government facilitates such e-learning platforms at the school level.*

Along with this, AH and BH from AS and BS said, *there were not any online applications before we were students. Nowadays the students have many options and online mediums platforms.*

Similarly, the e-learning application named Midas e class was introduced in 2012 where the inventions launched that address the educational needs of Nepalese students. This application with its website provides the study contents that are related to the subjects and the curriculum, with the online teaching and communication tools that are relevant to the school students from kindergarten to class 10 along with their parents. Besides the e-learning application Midas, there have been few more e-learning sites in Nepal.

The other one that provides the online learning platform is KULLABS smart School website where this website was developed by the Kul Techno Labs and Research Centre which was established in 2015. On this website, the presence of the curriculum of the schools addressing the Nepalese students within the teaching in the digital form and which was further designed by the Government of Nepal. The main theme of this website is to reduce the physical textbooks and lightweight and to have creative multimedia platforms such as laptops and tablets. This e-site helps the students from grades 8 to 10 to pursue their studies in the online form. In comparing both the applications Midas application required charges for the online learnings where the KULLABS is free for everyone with its unlimited course materials presented on the website.

With such steps, we can see the process of development in the e-learning platforms and the use of ICT in the learning environment from the nursery level to the university level. The policies implemented in the education system related to ICT are based on the teaching and learning process. The initiation of the Government of Nepal along with the Ministry of Education in

collaborating the digital settings in the schools to bring quality education and online learning prospects in all areas of Nepal.

It is also mentioned that the schools in urban and rural have significant differences along with their topography, climate, physical and human resources availability, economic aspects. For the government, it might be very challenging to establish and mobilize the schools in far rural areas where with the difficult transportation areas the children might suffer a lot from the education mainstream. But with the provision of digital teaching and online study materials makes the teachers' and students' teaching and learning process easier.

### **5.3 Examine the factors that contribute to integrate the ICT in the government schools of Nepal**

In this 21<sup>st</sup> century, Government schools of Nepal are still facing a range of problems in including the ICT into the teaching and learning process whether in an educational curriculum or in the methods of instruction and improving lifelong learning skills. The most important integration for the betterment in the education system in the government schools is to collaborate the ICT in the education for restructuring the educating policies and collaborating technologies in the teaching practices and the inclusion of technologies for the teaching and learning practices for both teachers and the students.

The Information and Communication Technology (ICT) plays as a versatile platform in the education system, it's not only improved its learning capabilities but let's students overcome difficult situations of questions to improve their academic learning skills. The barriers that are keeping the education of the government schools back behind the line of the development processes are explained below as highlighted by conducting the observation and interview methods from both schools of the Kaski district where the research was conducted.

#### **5.3.a Infrastructures**

Infrastructures are the basic and most necessary things that are needed in every aspect of social, financial development. To the schools what I observed when conducting this research, the necessity of the physical buildings where the students and teachers can teach and learn along with the administrative sections and different buildings and rooms for different purposes.

The computer labs in schools with computers, projectors, big-box speakers, microphones, laptops, printers, router boxes, and other tools, etc. The basic requirements to conduct the schools are the need for physical infrastructures and the tools and technologies that need to be set up in the required rooms and offices along with the power supplies in the schools.

With the different topography of Nepal, mountains and many of the Hilly regions have no power supplies and internet facilities along with the proper physical infrastructures to manage the tools and technologies and ICT teaching settings in the schools. It is very hard to install the technologies over such places where it is difficult to maintain their tools to have functional teaching.

AT and AH from the AS happily said, *we are getting the ICT facilities in the school.*

A1 and A2 from AS said, *we are happy to learn new things with the help of the computer and projector.*

B1 and B2 from BS school said, *before it was limited in some subjects.*

BT and BH from BS said, *the government is trying to conduct ICT facilities and we can use them in every subject in the ICT settings.*

Using the technologies in educating the students, gives more clear vision to the students about the topic and the content that is presenting in the classroom. With such phenomena, the students enjoy themselves a lot and were happy. It helped the students to visualize the subject matters with the interaction between the teachers and the students. With these processes, the students were engaged in all subjects with enthusiasm. In the classroom, teachers study the content and the situation and prepare the slides, and present the animation related to the subject matter that makes it the students easier to understand their subjects.

The BH from BS said, *we have the hope of having more better ICT facilities in the schools. The drawbacks related to such development in the schools are internet facilities and the load shedding that ruined the planned design of the school.*

It is very tragic for a nation like Nepal which is rich in water resources but suffers a lot from load-shedding issues. Nepal is counted as the second richest in water sources, but it is very hard to say that people are hardly getting enough electricity for their development plans. This scarcity hampering all spheres along with the school's power supplies. This is not a big issue for a country to improve as the power and the administrative system are in the hand of the government.

A1, A2 from AS sadly expressed it and said, *the load shedding affecting our daily classroom schedules.*

B1 and B2 from BS said, *as the class starts then the electricity goes off and the teachers couldn't teach us in the ICT settings which we have prepared for us.*

Connecting with the issues, A1, A2, B1, and B2 from AS and BS said, *if there is electricity then the internet becomes very slow, or it does not work and it becomes useless. So, the teachers had to teach us in the manual methods even they don't want to teach with it.*

AT and BT from AS and BS stated, *we have the instruments needed for the internet but don't know what's happening to it.*

When there occur educational meetings between the school authorities and the governmental body, they raise the agendas regarding it, and they are hopeful for the upcoming plans as stated by the teachers.

AH and BH from AS and BS said, *we often have meetings with the local bodies about the educational issues and with that, they said these problems would be addressed in the future.*

The government has planned for their ICT settings in the schools and implemented some of their programs according to their plans but within the practical issues, there is a huge gap in the implementation process.



### 5.3.b Monitoring and Evaluation

AH from AS said, *the teachers who are qualified in the teaching process and received the trainings related to the subjects may be neglecting to teach the subjects in the ICT medium.*

AT from AS said, *the teaching quality that some of the teachers who received the trainings from the Government and the other NGOs and are good at the teaching processes, but they felt that their experiences and their knowledge were not valued appropriately.*

BT from BS said, *the Government and the school administration should observe the qualified teachers with qualities and prioritize them in ICT based teaching process.*

It also has been seen that the government schoolteachers were more engaged in the private sector's schools and the colleges as they received more financial facilities. The teachers in the Government school who are more qualified were awarded by the private schools, so they see their value and their respect in such schools.

BH from BS said, *the teachers who received the trainings from the Government and the NGOs get awarded by the private schools as some of the teachers are engaged in both private and governmental schools.*

BT from BS said, *the teacher who are qualified in their education and has trainings are valued by private schools. The governmental school does not care for those teachers who want to develop their careers.*

The teachers were involved in the government school and teaching for many years. It's quite difficult and time-consuming for some teachers to prepare their content in the ICT settings like making the slides and presentation and present it to the students. It is a very effective tool that helps the students to acquire more ideas and information about the related field, but the teachers prefer to use the manual setting of teaching method that helps for such teachers for their time and energy savings.

### 5.3.c Time Consumption

In the government schools, the teachers must take many classes in a day, around five to six classes per day. The situation becomes worse if any one of the teachers becomes absent in the day. Then they must cover all the absent classes and they don't have much time to prepare for such presentations and present in the classroom as they prepare their content in the earlier weeks and it will be new to the teachers for presenting the classroom. It will consume the time that they have planned for it.

AH and BH from AS and BS said, *the teachers were given the assignments but due to the absence of the teacher, there is a limited number of staff in the schools. The rest must cover the classes and they might not have enough time to resolve such a situation. The teachers also have other duties besides teaching so they would have busy schedules.*

Also, AH and BH from AS and BS said, *there are not proper internet facilities, and the load shedding schedule directly affects the teaching patterns.*

AT and BT from AS and BS said, *we must take our time to make presentations and study before presenting in the classroom. So, moreover, we were forced to teach them in the traditional method.*

The teachers prepare their content in earlier weeks as they hardly have time for preparedness in their school time. So, after the school day, they had to manage their subject content. One of the main drawbacks that lead the ICT behind the teaching that teachers felt was the excessive number of their teaching classes and their time to prepare for their plans.

In this aspect, students also understand the teacher's feelings. They know that the teachers are taking many classes and there are no proper breaks from each class. The innovation and technologies adopted in the classroom need time to make ready for the presentation.

A1 and A2 from AS said, *the teachers are taking 5-6 classes a day and they do not have much time in installing the tools and devices. Also, the internet facilities and the electricity supply and load shedding take more time to present the related information in the classroom.*

B1 and B2 from BS said, *due to a limited number of teachers, if someone is absent then there is no alternative teacher organized by the school and the burden must cover by the other teacher.*

BT and AT from BS and AS said, *if some of the colleagues are absent then we have to merge that class with the other class and try to cover the same subject with different grades.*

### **5.3.d Lack of Inspiration**

The government has provided the teachers' trainings to the teachers and very much basic tools for the schools to run their curriculum in the ICT settings or teaching some of the subjects digitally but there is still something lacking for not having better results or learning environment for the students. The inspiration and the motivation that the teachers deserve with their education background, their trainings, their qualities that they can teach far better but the schools and government neglect somehow and compares all the teachers as same might degrade the teacher's self-motivation towards their teaching skills.

In the schools, the teachers who received the trainings regarding the ICT settings teaching practices could take the classes but those who didn't receive such trainings were not committed to such ICT integration into the classroom.

BT from BS said, *the teachers should be awarded or get benefitted who facilitates their classroom in digital learning and promotes other colleagues for their teaching process.* The AT from AS said, *if the schools do not value our teachings and our motivation towards the students then it is just a waste of our time and effort, so it will be better to teach traditionally.*

The AT, AH, BT and BH from AS and BS agreed and said, *the issues from both schools that we have very few supervisions in the schools and ICT setting teaching practices in the schools.*

The teachers stated such issues that were hampering the classroom teaching methods as there were few supervisions in the schools due to that some teachers do not follow what they have learned from their trainings and programs. Some of the teachers even said that most of them were not interested in such teaching as it consumes much time to prepare, and nobody is

checking for their manual teachings. So, due to such phenomena, the school's headteacher and the government official personnel should have effective supervision frequently to check their teachers guiding their students and teaching in the digital settings which guides them and motivate and inspire them to have better teaching and learning aspects.

### **5.3.e Digital Teaching and Learning**

The teacher's and student's cooperation and coordination plays a vital role in the teaching and learning process. The teacher teaches in the environment of learning for the students. The teachers are the pioneers that adopt the ICT in the classroom and teach from the digital settings. The variation of the using the ICT may differ from one subject to another but the uses of it make the learning more interesting to the students. If the teachers know well about the tools and technologies and can utilize their teaching contents in the ICT settings and make the classroom more interactive, then the students learning capacity would increase.

The government has formulated the policies and plans that describe the online study platforms, but the teachers are not used to it and it is affecting the teachers and the students. The government also needs to provide the trainings and supervise the teachers about such applications they have highlighted then the teachers could pour all their skills and knowledge into the classroom.

AT from AS said, *the e-learning materials should be the focus for the teachers as they are the ones who are the teaching in the classroom.*

BT from BS said, *the priority should be given to the teachers for providing the materials and trainings regarding ICT settings.*

AH from AS said, *the teaching-based online materials should be set up by the teachers, but they lack the knowledge about it.*

If the teachers were involved in these e-learning trainings and programs, then they could base their knowledge in their classroom and can clarify the students about ICT-based digital learning. With such teaching practices, the students would gain more understanding about the subject matters.

As mentioned in the social constructivism paradigm, the knowledge, and the capacity they gained from their initial learning and with the help of technologies and the teacher guide can

gain more information and knowledge regarding the subject matter that was used in the teaching process.

A1 and A2 from AS stated, *what we learned from the books and what we learned from the digital presentation of the related subjects make a vast difference in a learning capacity.*

B1 and B2 from BS said, *it is also interesting to learn from computers, new things for us. The teacher interacts with us and asks us questions, and has the discussion giving examples makes us so clear about the contents.*

The teachers underlined that the teachers attempted their best to make the proper use of the available ICT resources for their teaching process including the tools like computers, projectors in a classroom to present their materials. Due to the weak and inefficient internet facilities and the lack of proper functioning of the computers in the computer labs would hinder the teachers while using the digital tools in the teaching process would make them feel frustrated with the teachers. Along with that the teacher's abilities and skills restricting ICT in teaching which leads them to have a poor practice of the modern tools and technologies.

### **5.3.f Status of Teachers**

In Government schools, the teachers are categorized into different parts and they are permanent teachers, temporary teachers, *rahat* or quota teachers, private teachers, Per Child Funding teachers (PFC) (Rana, 2016). The teachers with the permanent job can end up with the pension system but the remaining ones without the pension. The permanent and the remaining other teachers in the government schools are nominated by the Teacher Management Committee and the School Management Committee (SMC) respectively. Teachers who are permanent, temporary, and quota system were paid moreover same wages, but the remaining others have low wages as per their teaching tenure. This has been an issue with these categorized teachers in the teaching and learning process.

AT from AS said, *the status of the teacher's positions should be nominated by their qualities in the teaching areas and determine their level.*

AH from AS said, *the teachers get the trainings and involved in the programs to have better teaching approach and makes their content of study materials effectively but with*

*some uncertain information of the government there arrives new teacher nominated by the governmental bodies.*

*BT from BS said, the pension system as we all teach the same years but the permanent gets more benefits and rest get almost nothing. This will demotivate all the remaining teachers like us in our daily teaching practices.*

*Along with that, the BH from BS said, the headteacher and the school authority with SMC have interacted quite often in this critical issue but the government appoints the teachers, and it is very sad for such teachers that we cannot do anything.*

There is a variation of the teacher's positions that impacted the teaching practices. The teachers besides the permanent have always fear and worry about their job position as they are appointed for a certain period. The permanent teachers are there until their pensions and if with uncertain conditions, then they move to other schools, but they can work. This varying situation of the teachers and the insecurity of their jobs can affect the daily teaching processes as they can see that the government nominates the permanent teachers in their positions.

The teachers with the headteachers discuss the lack of leadership and motivation created by the Government itself in this vital area in educating the children. The teachers also suggested that the government should think about the career of the teachers and their qualities in formulating the policies when appointing new ones in the occupied positions. If the teachers are not satisfied and are afraid while teaching about their jobs, then what can students learn in such situations in the schools and their classroom.

### **5.3.g Trainings and Teachers Age**

In the government schools of Nepal, the government provides the required trainings and programs that are suitable and effective for their teaching methods in all regions of the nation. The government also provides such trainings for the betterment of their teaching qualities.

*AT from AS said, most of the teachers do not constitute ICT learning settings in their teaching practices in their classroom which also demotivates the other remaining*

*teachers. The teacher who received the training from the government and still lacking in their teaching process.*

The schools provide the trainings for the teachers focusing on their better classroom learnings. But in the government schools, the senior teachers get an emphasis on such trainings who are reaching to their retirement age and still they participated in such trainings. The problem arises in such a situation that those teachers hardly use ICT in their classroom and in general. The trainings which were required to those teachers had to go back as they are not that senior to the school and the school priorities them to have such programmes and it mostly can be seen in the schools teaching.

*BT from BS said, the school administration should be responsible to nominate the right candidate for such trainings if they are selecting few among all. The needy one might be missing valuable information.*

The students also agreed that the senior teachers prefer to teach in the traditional methods as they have the experience in teaching with such process and refuses to teach them with the help of technologies. They were comfortable manually teaching their subjects using the chalk and the blackboard.

*B1 and B2 from BS said, the senior teachers are also better, but they prefer to teach traditionally, as for us it is very much comfortable to learn from the digital settings. They also wished to have all their subjects to be taught in such an environment so that everyone would gain more and better understanding of the subject matter.*

*A1 and A2 from AS said, the teachers who are familiar with the computer and internet properly and are teaching them talk and teach us in the ICT settings and explains us with lively examples where compared the other teachers who do not prefer computers teach in the old traditional way.*

### **5.3.h Lack of Financial Resources**

The government schools are run by the Government of Nepal. In such schools, the government offers the students that they do not need to pay or less for their tuition fees, and all the expenses on the stationary materials are provided to the students. The burden of the financial part of the schools is taken by the Government.

A1 from AS said, *the government has given the computers to their schools.*

AT from AS said, *with very low fees for all the students who wants to study in government and public school.*

AH from AS said, *government provides the scholarship funds to the merit students.*

A2 from AS said, *I don't have to pay any amount and the stationary materials provided by the schools.*

B1 and B2 from BS said, *the low- or middle-class families cannot afford the private schools and the government schools provide such benefits like low or no tuition fees, schooling costs and, they give free books, copies, pens, and pencils to such families to send their children to the school.*

Together B1 and B2 from BS said, *we are very thankful for it.*

The salaries and other wages provided by the government to their employees included all the staff of the school. For the ICT settings, the government provides all the necessary budgets to covers all the needs of the schools.

AH and BH from AS and BS said, *the government schools prioritize the student's welfare and their learning process for their upcoming future. Whereas in private schools the parents have to pay a huge amount of money to the schools. The burden of the student's financial issues was taken by the government.*

Adding to it, both AH and BH from AS and BS said, *the government also provided some tools and technologies like computers, projectors, microphones, speakers, and other stuff for the schools to use for the teaching process. Adding to it, teachers from both schools said for the budget of the maintenance of such technologies, to set up the power supply because there is not uniform electricity flow in the schools.*

The schools need the financial support not only to run their fiscal year but also required for the maintenance of the schools and their infrastructures. It is also a heavy part of the GDP that government must provide to all the government schools in Nepal.



AH from AS said, *there is some sort of funds in the school administration that they keep for their necessity and to utilize it for the required issues of the schools.*

AT from AS said, *the school administration always says that they have so much to do with the little budget and take care of their schools' issues for a whole year as the government provides once a year.*

The teachers also agreed that the government funds every training they required and needed for their practices to teach in the schools. With every official meeting and trainings, the government also provides the wages or fund to the teachers and the school administrative bodies according to their requirements.

This part is related to the governmental budget and its provision in the schools. It is also necessary to understand the cost for the education and its related entities and its expenditure by the schools in different aspects and identify the available resources for the schools to see the financial gaps with the demand and supply chain. With these findings, there can be identified the overall cost expenditure of the school at the local level.

Maria Melizza Tan, program officer for ICT in Education at UNESCO-Bangkok, stated that even though the government is investing a huge budget to develop the ICT settings in the schools and their infrastructures, power supplies, internet facilities to improve the education and the teaching practices. She added on such statement that no evidence proves that there were not any significant steps taken to deliver that policy's implementation.

### **5.3.i Lack Skilled manpower**

A significant number of the teachers from both schools emphasize that there have has qualified teachers in the government schools. It is not that the government does not nominate qualified teachers as they regularly keep the teachers for their schools. There is always a huge demand for such teachers, especially for the science and mathematics subjects.

The National Curriculum framework 2007 and the Masters' Plan (2013- 2017) have highlighted the inclusion of ICT in the school contents and the curriculum but the scenarios

that we need to understand the reality of the lack of skilled manpower in mobilizing digital teaching of their curriculum.

AH from AS said, *the teacher who received the trainings from the government and from the NGOs, instead of using their qualities in the teaching practices in government schools they focus and prioritize for commercial purposes.*

The well-educated, qualified teachers get the opportunity easily everywhere. The government and the educational institutions provide the trainings and make them skillful as per need of the schools. The qualified teachers not only seek commercial purposes but also fulfill the country's skill manpower and promote their skills in their field. With such issues, the schools should remunerate the skilled teachers and give incentives for their motivation.

BH from BS said, *the teachers have a lack of commitment in teaching and implementing ICT in their classroom.*

BT from BS said, *the government does not monitor our activities and provides awards for their good works, so we feel that they are demotivating and compare us with the other teachers.*

The government always focuses on the skilled manpower in every field that schools required. Giving up so many trainings and programmes conducting in the schools. Teachers also stated that the headteacher is also responsible for these things as the teacher's activities of teaching in the ICT settings should be monitor and evaluate their teaching which promotes their teaching skills.

A1 from AS said, *there is a computer lab in the school, but it gets shut down most of the time as the schools said it's not working.*

A2 from AS said, *the teachers say that they will take us to the computer lab for better understanding but most of the time the door of the lab is closed.*

With such an issue, teachers from the same schools added that the school should have a technician for the lab as the computer may have minor issues while functioning and the school administration says that it's not working, and they will close it. Furthermore, teachers said the government has provided so many technologies for the schools but due to the lack of proper manpower the tools are laying down for many years.

The schools have so many gadgets and tools in their storerooms as they look new, but they were lying down for many years as reported by the headteacher and while observing the computer lab and it is stated that the lack of the technicians the schools have to put all those tools in the store.

The country has so much skilled manpower in different fields where the government has to create the opportunities for such qualified people to contribute their skills, ideas and knowledge then it is only possible for a nation to move in the path of development. The country and its responsible bodies can give some trainings to sharp their qualities in the education sector. Then it will be better for a nation that such skilled manpower can utilize their knowledge in their homeland rather than searching for overseas markets for employment options.

### **5.3.j School management system**

For every school, there is a team where there are various people with different roles and responsibilities to bring the school. The team is responsible for all the activities that have to be done in an official aspect. A school with an approach to stay efficient that will carry out the individual functions, link their whole school management operations and tasks and simplifies day-to-day workloads, and provides time for the teachers and the staff to connect with the students.

School Management Community (SMC) is a very vital body of the school that provides the platform for the teachers, headteacher, school authority, administrative bodies, and parents to bind together to enhance the quality of education. This system also takes care of the daily activities, day-to-day plans of the schools, students' fees and their necessity, student attendance, student learning performances, accounting and auditing of the administration, and their budget plannings.

*AT from AS said, the School management team should be the platform for all the people responsible in the schools and gives an interactive environment. When we raise the issues of drawbacks in the team elaborating the issues that are hampering the school's education like the need for technicians, infrastructure development for the computer labs, etc. but we feel that the authority does not respond properly.*

BT from BS said, *the headteacher is main responsible for the SMC system. He often goes for a meeting, seminars and in the local functions that hampers the meetings and gathering of the teachers and the staffs. Also, the headteacher nominates some other teachers in their absence, but the other staff and teachers do not respond to them as their headteacher, and it is just time-consuming and not effective schools plan implementation.*

The headteacher is responsible for all the activities that are happening in the school area. They have so many tasks and responsibilities that can be done at the same time.

AH from AS said, *there are mixed duties of the headteacher and the school administrative body that I must take care of every aspect of school, governmental bodies, parents' meetings, every issue that arises in the schools, students' issues, teachers' complaints, and issues and their promotion, etc.*

BH from BS said, *we have so many tasks to access teachers' performances and students' participants, mobilizing the resources like financial, human and mobilize them as per the needs of the schools.*

With this thing, the teachers focus on the SMC roles and responsibilities and highlight the implementation of ICT in the administration system and the school management team. The attendance and the presence of the teachers and the students were taken traditionally with pen and in the notebook. But with the government's new system to put the digital attendance to the teachers made the teachers and the staff come in time and leave after school time.

AT and BT from AS and BS agreed and said, *this is a very good initiation from the government side that all the staffs should come in the school time if not then their salaries will be deducted from their attendance. In this way, the SMC also could monitor the staff, teachers so that the headteacher could monitor and evaluate the teachers' teaching and the students' performances in their classrooms.*

While observing the schools and the offices I saw computers in the administration office where they use them for writing emails, print out the documents, give printed payslips to the teachers, type the notice for the schools, and other administrative purposes.

Some of the staff said who are not included in this research participants that before they had to write all the documents by their hands as if that is notice letter to the teachers or the staff, students' attendance, official letters to other schools, information letter to the parents or the government bodies, etc. It was very time-consuming but now with the technology, it is much easier and time-saving for us, and work is going easy now.

### **5.3.k State and Schools policies**

The government has amended various laws, rules, and regulations to formulate and implement such policies. One of the bodies that regulate the education system that falls under the Ministry of Education which is directly responsible through the educational institutions under its authority for formulating the education policies, plans. The governmental body is also responsible for planning and executing and track the school's activities of 75 districts schools with their subdivision bodies like the Department of Education (DOE), Zonal Education Communities, District Education Offices (DEO).

The zonal education offices have the responsibility of overseeing the services conducted by the Five Regional Education Directorates (REDs). Within this, there are 75 District Education Officers (DEOs), and 1091 sub-district Research Centre (RCs) are the key official educational bodies that take initiation and service administering agencies at the regional level. (MOE, 2010).

The schools implemented the rules and regulations from the Ministry of Education. The Government has provided all the necessary aid and supports to run the schools. The School management team which nominated by the District Education Communities (DEC) to run the school administration system.

The National policies aspire in the Education in ICT, Master Plan 2013- 2017 with the ambition to grow ICT into the schools without a strategic plan and effective implementation of ICT for the facilities of schools and teachers. Along with that the School Sector Development Plan 2016- 2023 also emphasizes the ICT settings in the schools and to integrate the Nepal education curriculum into the global community and helps the citizens to involve in the technological world.

While observing and from the interview methods, I found that there are no such school policies or any written documents that connect the policies for the schools. There is found the school regulation documents that were old enough and outdated.

AT from AS said, *we have not heard anything like that in our school. With our knowledge, the school follows the governmental bodies instruction to run the school. If there is something like that then it might be somewhere in the school administration, but nobody discussed it till now.*

The BT from BS said, *the school policies are the top-down method that government makes policies and informs the school authority to implement.*

The AH and BH from AS and BS said, *governmental lack of supervision, they miss the ground reality of the schools and formulate the policies from the Centre of the nation; due to that the policies implemented from the top to bottom approach may not having the proper grassroots level understanding of all schools which makes the education policies failed to implement in the country.*

*The AH and BH from AS and BS said, there were trainings and programmes conducted by the government of Nepal but to have interaction in between the school authority and the governmental personnel about the school's issues, teachers and students' suggestions, ICT settings in schools, and proper training to the teachers and infrastructures development. The government hardly takes our responses to implement such policies to the schools.*

From such interviews from the teachers, it shows that there is a lack of proper communication and interaction towards the school's settings and ICT teaching and learning process effectively implementing in the schools between the schools and the Ministry of Education and the stakeholders.

The AH and BH from AS and BS said, *the school is governed by the Ministry of Education and the policies are implemented in our schools. The school has their own internal rules and regulations documents, and which is also old dated. But we have planned to update it and document it to influence teaching and learning in ICT platforms.*

The teachers suggested to the interview that the schools should have school policies related to the governmental plans. As they have the technology that they can make it with having a proper

discussion with the SMC, administration, and staff, and the teachers, the school policies can guide us to achieve the school targets in the digital literacy learnings and proper management of the school resources.

Although, the Government of Nepal and the Ministry of education in their documents on the Higher Education Policy- 2015 has not mentioned anything about how the ICT can help in the teaching and the learning processes in the Nepalese education system or how this can be accompanied by more realistic implementing initiatives. So, with such a process, it shows that the GON and the Ministry of Education thus neglect the need for details about how the ICT in teaching and the learning performance should be applied and accessed. Within the Proposed Higher Education Policy 2014, it has just expressed the few lines where the technology is being promoted in education without explaining any additional criteria and how this can take care of higher education. In its management announcements about technological use in the education sector, the Ministry of Education is less precise in its declaration of governance surrounding digital integration than the Ministry of Information and Communication. Along with it, this indicates that there are few prospects and incentives for the education system in Nepal in response to the policies documents developed by the Ministry of Education. Therefore, the study will now shift to actions taken in the case context of the Ministry of Education with collaborating with its local bodies in attempts to combine the ICT in its curricula based on these assumptions.

In this chapter, the research was conducted with the teachers and the students regarding the interview methods, observation done along the school environment. The school teaching and learning procedures and the ICT settings in the schools helped and explained the principles of these various methods conducted to introduce digital literacy in the education system in Nepal. With such issues, it also explained and highlight the impact of ICT in the education system in the teaching and the learning process and the future challenges.

The first research question highlights the extent of using ICT in government schools of Nepal. It describes the government policies and plans that were formulated in the education mainstream of the country. What sort of policies has been implemented by the government and what are the changes seen in the government schools of Nepal. The teachers conducting the ICT in their teaching processes in their classes even though they were having challenges and problems in teaching and learning processes. It is still a challenge for the government schools of Nepal for implementing such policies in practical aspects of the education system. In the

teaching and learning process, the uses of ICT strongly encourage both the students and the teachers to conduct their plans in the digital setting even after having constraints with the technology and their contents and lessons are hardly technological.

The second research question highlights the barriers and the problems that teachers and students face while integrating ICT in the teaching and learning process. Regarding the issues that hamper the development of the application of the ICT in the teaching and learning processes in the Government schools of Nepal are still facing the major obstacles that are linked with the financial resources and the infrastructures counting as the most significant barrier. The factors that slow down the process of ICT development in the education system and in the schools regarding the development of the infrastructures, the time limitation, lack of financial resources, lack of skill human resources, lack of inspiration to the qualified teachers, and even the infrastructures implementation in the classroom which also further indicates that they already have a dilemma in teaching process in the schools using ICT collaborating the study plans in the classroom. Factors also affecting the ICT settings highlight the school management system and the Ministry of Education for not having active monitoring and evaluation of the schools and their development related to ICT settings at the schools.

#### **5.4 The perceptions of teachers and students and the uses of ICT in schools**

In general, with this research project, the initial and the primary intention of this research is to map the ICT settings with their access and the uses in the school's environment. The second part describes the use of ICT in the classroom by the teachers and the students. The third focuses on the research projects and the gaps marked within the teachers and the students in the integration of digital settings in the teaching and learning process. The last goal of this research is to mark the barriers and problems faced by both teachers and the students and recognize hurdles to ICT inclusions in the classrooms for teachers in their school settings.

These future enhancements with the diverse ideas and theories focused on the individual educational and the government policymakers, scholars, and the educational theorists are commercial, belief, and comprehension. Such in the learning theory, it promotes the teachers integrating the ICT in their pedagogical procedures from the theories of the behaviorist to the



constructionist which further provides the teachers to utilize the technology and the tools with the constructivism theory of learning.

With the social constructivism theory, Vygotsky's empower the students and the teacher's relationship in the teaching and learning process by facilitating the technology as the means to improvise their learning outcomes. Along with that, (Armstrong 2005; Ghavifekr & Rosdy, 2015, pp. 175-191) added and motivates on the utilization of the tools and the technologies are far more relevant than having the installed software, applications and the teachers are the key players in incorporating tools and technologies in the teaching contents and lessons to develop the quality connections and interactions to the teachers and the students, technical assistance, and the teaching contents.

With this research topic, I have mentioned and highlights the government policies and plans implemented and how the government and the Ministry of Education integrated their ICT policies in the education system in Nepal. With such phenomena, the emphasis is also given in the digital settings and learnings in the teaching processes. In the earlier chapters, there have been also indicated that the students and the teachers interpreted the educational changes introduced by the trainers. The core features listed include technology management, promoting and improvise the student's learning capacity, and the utilization of various resources for the curricula teachings. With these activities, this chapter explains how the participated students along with the teachers conceive and construct their teaching strategies in their classroom.

#### **5.4.a Students and the Digital literacy**

While researching in both government schools of Nepal, the students hardly use the technologies besides their science and mathematics courses. With such phenomena, the students hardly get used to the computers and the technologies with their own besides calculators. Therefore, they have fewer chances and opportunities to visit the computer classroom. Even though the Government and the NGOs implemented the program for one child one laptop, but the scenarios were different in theoretical and practical perspectives.

The A1 and A2 from AS said, *the computers are mostly used in the office and the library. There is also a projector in the school, but they hardly use it for study purposes.*

The A1 from AS added, *the teachers used laptops and other electronic devices in the school premises and sometimes in the classroom for teaching.*

While taking an interview, B1 from BS stood up and said, *what is Information and Communication and Technology? I don't know anything about it.*

With such query, it might be clear that the students do not understand even the term of ICT due to their lack of information provided by the schools and the teachers which I clear them the concept of ICT and its settings in school.

The B2 from BS said, *the devices like computers, laptops, speakers, and projectors are for the school's teachers and the administration, we don't know how to use them. The teachers bring their laptops to the schools, but we don't know anything besides that.*

For the teachers, they have their laptops, and, in some cases, the schools also provided them the laptop and projectors, and the use is limited till to the teachers or the school administrative bodies, but the students hardly get the chance to operate or use for their study purposes. Along with the research, due to the large, populated classrooms, the teachers conducted the classroom by using the microphones and the large speakers to reach the voice to all the participated students and often the students also take the opportunity to use the microphones during the lessons and speak in the classroom to have better interaction.

AT from AS said, *the schools provide us the computer as per our need. We make our study materials on the computer.*

BT from BS said, along with the study materials, *we also use such tools for our purposes.*

BH from BS said, *we have a computer lab but it's not in the right order. We cannot fix it as we are not the technicians. So, it is laying there for a long time.*

The school with such facilities with the computers and the lab but not having in the proper order might demotivate the students for utilizing it for their learning process.

BT from BS said, *the students are very curious to learn their subject matters with the ICT settings but with many barriers with not having proper power supply and internet facilities, etc.*

AT from AS said, *if these problems regarding the lab and the ICT settings were solved then the problems coming up with the computers does not make the students behind the utilization.*

The students and the teachers also suggested that the students or teachers having the laptops if they can be used for their learning process would be much more beneficial. But the schools have their own rules and regulations about bringing their gadgets to the school level, but it is possible for the higher-level students in Nepal.

Most of the schools in Nepal are forbidden to use cell phones and any such electronic gadgets in the schools or in the school peripheries for the students where such devices were used by the students in their home. It is not permitted to use them in schools.

#### **5.4.b Peers interaction**

The interactions between students are very much common in the learning process in the classroom. It is also an essential aspect that plays a vital role in the lifelong learning habits of the learners. Some students might be more receptive to others and each student has their learning capacities. Along with that, the students who interact with their peers might be socially active and those who do not might be socially isolated if they avoid their interaction in and out of their classroom and along with their subject matters.

The A1 and A2 from AS said, *if we don't understand about the study materials or in the use of computers, we ask each other if we know and get ideas from each other's, it makes us easy.*

The A1 from AS added, *the student who is not good at learning might ask the teachers several times, and the teachers are not happy. They sometimes become angry.*

Along with it, the A2 from AS said, *if we ask the teachers, then they might say I taught you earlier and you still don't know. So, the students are afraid about asking anything the teacher.*

The students seem more comfortable to the students as they will tell them without the feeling of hesitation. The teachers' traditional teaching concepts might encourage the students to have peer interaction.

*The B1 from BS said, the teachers promote to have interaction in the classroom, and we all share what we know then it will make us understand the subjects. Sometimes it is also depending on their emotions.*

*The B2 from BS said, we are more comfortable asking our friends anytime and anywhere as we are sitting in the same class from 10 am to 4 pm and learning all the subject's contents together and they will tell us what they know.*

While observing the peer interactions, the students were more comfortable with each other. The teacher also gives time to the students to interact with each other and continue their classes. But the teacher must limit their interaction time as they continue to discuss their whole classes related to the study contents and their issues. The teachers have scheduled their course contents and they need to cover their courses within the timeframe.

In the social constructivism approach, learning is the integrated process along with the inseparable aspects of the social order and practices (Lave & Wenger, 1991, p.31). It is the interaction with the peers, teachers in their environment. Learning practices occur within the interaction processes with the people where ideas and information are received by the learners in their everyday activities in the schools and from their environment. Students learn something from their own, some from their peers and other people.

However, most of the frameworks tend to embrace that the students who are motivated by peers and experiences both to admire learning and the academic process will also support their learning and intend to develop their critical thinking. The student's view about the peer interaction highlights the ideas on the sharing of information and knowledge through the experiences mediated by the peer or friends where Lev Vygotsky emphasizes that learners cannot reach their full potential without the help of other people. In this peer interaction, the peer and the teachers are the key factors that guide the students to reach the zone of proximal development (ZPD). It also defines the gap between the learning capacity of the students gained by themselves and with the help of capable peers or from the teachers.

The student's interaction with the students or their peer group is very much effective for the students as they learned the subject contents from themselves or the teachers.

#### 5.4.c Teachers Pedagogy

In general, the pedagogy can be understood as the teaching approach which defines the process and the practice of learning and the factors affecting and influenced by the different aspects of the socio-economic, cultural, psychological growing capacity of the students or the participants. The pedagogy in the academic discipline can be understood as the information, ideas, and knowledge and how they transmit in the educational aspects where the interaction happens with the teachers and the students with the learning process. In the teaching process, the literacy transition from reading, writing, and communicating skills to the cognitive digital capabilities has not been discussed in the teacher's pedagogy. Teachers not having the technical expertise of the pedagogical contents to incorporate digital literacy into the teaching practices.

The teachers who are running the classes with the help of the ICT in the teaching process show that the students enjoyed more in this setting than without the ICT settings. The teachers used to teach their students in the manual and the traditional order where the teachers teach them as usual and the same module, but the students preferred to get information and ideas with the digital technology where they can see the living situation of their study pattern. As for the students and learners, it is very important how the students see and perceive the learning actions. With such phenomena, the environment of the learning needs to be structured in the digital settings in the teaching and learning processes.

In this qualitative research, the case study aimed to examine the teacher's qualities using the digital literacy platforms with having various skills.

The AT from AS said, *the teaching contents in the school's curriculum are almost the same in all the government schools but the difference is the knowledge and current understanding of digital literacy with the skills while teaching the students. Searching on the websites we can receive so many materials related to the subjects and the pedagogical skills and perceiving such understanding makes the classroom different.* The BT from BS said, *the school separates the courses and we all study about the contents but not having the technical skills and understanding of such qualities makes the teaching practices fragile.*

The AT and BT from AS and BS said, *most of the teachers in the government schools have many years of teaching experience but the main issue is the proper and effective use of the technological understanding in the teaching made us teach traditionally. The schools hardly organize such important pedagogical trainings often then it makes it difficult for the teachers in the pedagogy.*

Most of the teachers having the pedagogical expertise in their teaching practices but not having the proper understanding of digital learning and skills to improvise the classroom ICT settings and knowledge to set up digital literacy platforms. Having digital skills and understanding may not be enough to run the classroom. The teachers utilizing the ICT settings and their skills for the pedagogical qualities' integration. It is also to investigate the teachers' challenges they face while integrating the ICT settings in their teaching practices and the resources required to mobilize to improve the pedagogical activities.

In the government schools of Nepal, the schools required skilled manpower in their teaching subjects and the teacher who is already in their profession with or without the knowledge of the digital literacy skills in their teaching practices. The government also provides the trainings and programmes to the teachers and makes them able to use the tools and technologies to set the classroom into the digital approaches.

The BH from BS said, *the schools can't provide trainings for all the teachers at a time, therefore, the schools give some trainings in the schools.*

The AH from AS said, *the maximum number of teachers participating in such trainings to motivate and encourage to collaborate and integrate the ICT settings in their teaching practices. Also, there are two types of people, one encourages and is eager to integrate ICT in their teaching practices and others have no interest in it, as they are there as the school rules. The school must encourage and force them to use their skills and knowledge in the desired subject contents then the negativity of the teachers regarding integrating ICT will influence along with the school monitoring.*

The government provides the required trainings and programmes to all the teachers with the supervision of integrating ICT in the pedagogical practices but due to the teachers careless and not showing interest in such trainings can explore the negative attitudes among the teachers. The teachers also came to a point that there is no supervision from the schools and government after providing the trainings and programmes that how effective is the trainings in using ICT

in their classroom teaching. The headteacher is responsible for monitoring and evaluating the teacher's engagement in the ICT utilization in the pedagogical for the teachers which can affect the digital settings in the classroom.

#### **5.4.d Teachers interaction**

As in the schools, the teachers teach the students to communicate and share ideas and information about the study contents. It is to notice that not all students are actively participating in the classroom. By keeping such things in the teachers communicate with such students for them to be actively involved in the interaction process in the classroom.

*The A1 and A2 from AS said, the teacher used to teach us without asking anything, and we all had to listen but now the teacher asks us in the middle what we have understood about it. They ask and we answer happily. It feels that we are playing some games and it becomes very interesting in the digital settings.*

*The AT and AH from AS said, the students become so eager to listen and want to interact and they feel happy and talkative. In the classroom, we try to present the important information on the computer that students raise so many questions about it.*

*The BT from BS said, I separate some time of my class to the students to interact what they have understood and learned from the last day of the teaching. If some of the students were absent or did not understand then they will understand and be clear in that content.*

*Along with it, BT from BS said, we teach the subject in the classroom and everyone may not have the same learning capacity. We revise and ask them to interact with their peers who might be in the groups sometimes and promote them to learn. We listen to their interactions and if they are wrong or if they understood wrong then we correct them. But the students feel uncomfortable if they must ask about the subjects.*

*The AT from AS said, the teacher-to-teacher interaction in the school. It is not that familiar in our school to have interaction among the teachers. Some of the teachers leave the school just after finishing their classes. So, there will be hardly any interaction with the teachers discussing the pedagogical practices.*

*The BT from BS added, there should be teacher and teacher interactions among the different schools and how to exchange ideas about how they teach and their ICT*

*settings in the schools. There is no such interaction among the teachers. The headteacher realizes the situation and gives the suggestion and decision in every aspect as these interaction does not go from both sides of the teachers and the headteacher.*

*The AT from AS said, the headteacher monopolizes the situation and forces the teacher to teach the students without having the proper interaction with the required contents and the subjects. This is also hampering the teachers' psychological part in their pedagogical practices.*

The traditional teaching in Nepal especially in the Government schools is very much common in the teaching practices and has the one-way teaching method as the teacher teaches and the students listen. The scenario of the Government schools in the urban is far better in most of the aspects as we compare to the rural area's schools have very much difficult situation.

The role of the headteacher is to mobilize the teachers in the interactions and participation in such programmes and provides emotional support as well as encourage them to get more information and knowledge regarding the benefits of the teacher interactions.

#### **5.4.e Teachers trainings**

*“No single element is more essential to students' success than excellence in teaching. Fine buildings, equipment, and textbooks are important, but it is the skill and dedication of the teacher that creates a place of learning.” (Hickok, E. 1998).*

This quote shows the role of the teachers and their responsibilities that are accepted as the key actors for creating and contributing the students in a place of learning. In the Nepalese contemporary society, teachers are categorized as *good people*, they are the key actors to make a change in society.

For teaching the students the government and different NGOs organizes various trainings and programs for the teachers. Every year, many teachers get some sort of trainings in various fields to promote the quality teaching process in the schools. The Ministry of education provides many such informative programs to bring up the governmental school's education level. The



government provides the trainings to the teachers about teaching the study materials in the ICT settings and presenting the slides by using the PowerPoint as it included in the basic computer trainings.

*The AT and BT from AS and BS said, the trainings are given by the Government, the schools send the teachers who were working and contributed for many years to the schools and in few years, they might be retired and ready for the pension get the trainings by the priority basis. With them, it might be useless for them to learn and use it for a year and long. Along with this, the teacher teaches in the traditional method.*

*The AT from AS said, urban schools have more facilities and services to the students and the teachers in their teaching and learning process along with the dense population but in the rural areas in Nepal the population is low, and the schools are quite far from each other compared to urban schools.*

*Along with that the AT from AS said, the distribution of the trainings and programmes are very much organized in the urban areas and the teachers from rural areas must leave their classroom for a couple of days for such trainings. One of the teachers expressed his expression about how difficult is to manage the teaching in the rural areas of Nepal.*

*The BT from BS said, the trainings given are general to all the teachers as there are so many subjects and all the teaching methods are not the same and presenting might be different to each other. So, for the further trainings, the schools should categorize the specific theme of the trainings based on subjects or just the general ones.*

*The BH and AH from BS and AS said, the extra trainings, the government has introduced the new policies regarding the teaching experiences. The teachers with ten years of educations which is SLC and along with that a minimum of 10 months of teaching qualifications in the teaching areas and professions.*

*Along with it, AH and BH from AS and BS said, the teachers completing the teachers training courses and will receive the teaching license which is also the preliminary for the pedagogical practices. Even having teaching experiences in related fields but still there is so much gap in their teaching practices.*

Even one can generalize that the trainings provided to the teachers should benefit the teachers in their performance in the classroom so the students will improvise their learning process. It is also indicated the teacher's pedagogical practices integrated the digital literacy in the classroom and the student's success rate of examination increment shows the correlation between the two indicators.

With this fact that, if the teachers have been qualified, he/she can work and perform more successfully in the classroom which aids the students to develop their learning process and their examination. This illustration does not seem to convey the different pedagogical trainings given to the teachers in the Nepalese context. The examination rate of the students taken from the Office of the Controller of Examination, 2015, shows that the student's success rate is around 50% even though about 90% of the teachers have received the teacher's trainings in the schools.

It is just the fact that to present the relationship between the teachers' trainings and the student's examination success rate. With such a statement, (Mathema and Bista, 2006. p.26) highlighted the facts that the teachers with the headteacher especially in the rural area's schools have the habits of avoiding their classes with different factors like the teacher's trainings. They seek an option for their teaching classes. Pedagogical trainings are the means for the teacher's absenteeism nor their productivity in schools. With such phenomena, it explains the teachers not being inspired and motivated in their learning procedures and it is just an opportunity and a reason for them to leave and to avoid their tasks and jobs in the schools.

In the schools' teachers are working from the different fields and subjects and they required the variation of the training according to their necessity and requirements. The government provides the same trainings which prove that the '*One Size Fits All*' framework does not fit in these approaches. Therefore, the approach should be the use of multi-model pedagogical practices for the teachers who came from different backgrounds which will tend to encourage the teachers in their learning capabilities and integrate such skills into their classrooms.

#### **5.4.f Teaching contents integrating ICT**

For the students, while observing the classroom and from the interview, I found that they were very much curious and enthusiastic about learning their subjects' matter and the study contents

with the ICT settings in the classroom. They shared that the teachers teach more of science and mathematics subjects with the help of computer but to the rest subjects they prefer manual teaching method. From such phenomena, the student can focus on the studies more within the ICT settings in the teaching process.

The B1 and B2 from BS said, *the science and the mathematics subjects become more interesting as they are presented in the projectors and computers with slides but to the rest subjects the teachers show very often to the computer.*

The A1 and A2 from AS said, *such teaching we get information quickly and we don't have to recite, and it is time-saving. This is very helpful for us too even in the examination.*

From the students' voices from the interview and the participant observation students can study the subjects in the given time frame and even they can prepare their lessons for their exam.

Many teachers were working for a long time, and some were about to retire and get pensions. Some teachers were not even involved in the computer works and they prefer the traditional teaching materials. But many volunteers teachers were young and energetic and help them to prepare the teaching materials on the computer.

The AT from AS said, *priorities the teaching should be done digitally as this is the need of the 21<sup>st</sup> century. The Western world had taken their education so ahead and we the developing nations are back behind due to such drawbacks.*

The AH from AS said, *why Government schools are back behind in the education mainstream in the teaching process. The government is providing the trainings but still, the teaching practices are dominated and classroom-centered instead of student-centered with ICT settings.*

The government of Nepal and the Ministry of Education has provided several programmes and projects like Basic and Primary Education Project (BPEP), Primary Education Development Projects (PEDP), Online Learning Centre (OLCs), etc. along with the policies and plans implemented by the GON like ICT in Education in Master Plan 2013- 2017 which has not been able to adequately prepare them to teach into the classroom.

The AT from AS said, *the government has not yet provided us or the schools with the curriculum in the digital settings. I think the teacher is responsible for making related subjects' contents in the digital teaching and learning process but till now, not the*

*schools nor the government have taken any steps regarding such phenomena. If there are any official applications or web pages that are targeted for the schools containing the required curriculum should be linked with the teachers.*

*The BT from BS said, the point that there are many applications developed and run in the private level with some charges to the users but that is not official from the Ministry of education for the schools as I know.*

Along with the interview, I realize that the lack of communication and the information sharing among the teachers and the school authority created the gap between the teachers and the information they have on the online courses and platforms. The online courses that we can get like Massive Open Online Courses (MOOCs) provides an online platform to university students around the world. In the Nepalese context, Kathmandu University implemented similar online courses like MOOC named as Kathmandu University Open Online Courses (KUOOCs) where the university put up their materials in e-learning applications which are free and open to all and from anywhere people can take the needed materials. Along with such online courses, the university also established an e-learning application name 'MOOC for Higher Education in Nepal' which has encouraged the Nepalese e-learning environment which is relevant to the teachers and the headteacher but might be too advanced to the school children who are not that user friendly with ICT and digital learning.

Although, the e-learning application called Midas e-class was introduced in 2012 whereas KULLABS smart School websites are the other website where this website was developed by the Kul Techno Labs and Research Centre which was established in 2015. Midas inventions launched and addressed the educational needs of Nepalese students. This application with its website provides the study contents that are related to the subjects and the curriculum, with the online teaching and communication tools that are relevant to the school students from kindergarten to class 10 along with their parents. Along with that, Midas application requires some charges for online learning.

KULLABS's presence of the curriculum of the schools addressing the Nepalese students within the digital teaching and was further designed by the Government of Nepal. This webpage reduces the burden of physical books and makes them lightweight which contains creative multimedia platforms for the gadgets like laptops and tablets. It covers the studying materials from grade 8 till 10 to pursue their studies in the online form. This website is also targeted at

the students and is teacher-friendly where it can be used free of charge for everyone with its unlimited course materials presented on the website.

Although there are several teaching contents and courses in ICT friendly for the schools, the government should pursue the curriculum from the teachers who are responsible and take feedback from them. Also, the application should be both student and teachers friendly. The teachers agreed to see the official applications and websites addressed for teaching study contents for the schools friendly with online and offline features.

While observing the teaching practices in their classroom, I observe that most of the teachers in such schools are focused on the readymade course contents from the previous years which continue the same repeated course and no or little changes in the courses. It will be easy for them to teach and do not need to change any contents for their teachings. For digital teaching, there are hardly any proper course materials so whatever they find in the portal they will use and continue the same materials for further years.

Along with these the teachers from Alfa school also got trainings and guidelines from the programmes held by the Government of Nepal collaborating with INGOs and NGOs to develop the digital course contents for all the related curriculum they are appointed to teach in the school. They have learned the ICT settings and presenting the contents in the digital pedagogical settings. Even with engaging in making and designing the course contents, the official bodies did not approve their digital contents which further proves that there is a gap between the trainings given and the teaching content development.

*The AH from AS said, the school sent teachers for the teaching trainings and to develop the courses in the digital framework. First, the teachers and the school administration were laughing at me for so ambitious vision. But the teachers who tried to present their courses in the digital settings and their informative contents made other teachers and students interesting even though their digital contents are not approved by the Ministry of Education. Their attempts showed that they are enthusiastic about digital pedagogical practices.*

*The BH from BS said, there is still confused what to do with these digital contents as they are not selected from the government bodies and there are still no official teaching contents in the digital framework.*

Although, creating and developing the course contents and the materials development depends on the teachers containing the related skills and qualities in such fields. The gap in between the teacher's trainings to the digital content development affects the teachers which end up with no eagerness in the digital content creation and development which further focuses on the contents borrowing from other teachers or if not then they set it with the traditional teaching method where they do not need to involve ICT integration in teaching procedures.

#### **5.4.g Teacher encouragement**

In the traditional teaching practices, most of the teachers follow the classroom teaching towards the teacher-centered approach as mentioned in the literature review as the banking system in Nepal where students listen to what the teacher teaches in the class. The teachers used to prepare their study contents and teach with the theoretical pedagogical settings without the integration of ICT settings and practical presentation. The information that students receive might differentiate from the practical settings.

With the change of manual teaching approaches to the digitalized settings, according to the subjects and the context the teacher using the practical objects into the classroom learning then the teaching practices make much worth to the students learning approaches.

*The AT from AS said, in the classroom according to the subject, I try to present digitally or physically the tools and the objects that are related to the subjects when encouraging the students to learn in a better way.*

*The AH from AS said, the school provides the teachers required tools and things that are required in their teaching process. We have provided them the laptop, computer lab, and even the projector if they need it. We encourage them to use the required technologies for the students to get better learning.*

*The BT from BS said, focused on before starting the classes provision of things is far more effective with their study. It is more effective with technical subjects like science, mathematics, etc. but with the other theoretical subjects, it might be more challenging. In science subjects, the teacher provides physical things that are easily assessable to the schools. Along with that, the students listen very carefully to the teaching as they try to figure out the physical tools towards the study materials which*

*connects their visionary capabilities to strengthen their achievement of the area of their study.*

Some of the teachers in their pedagogical practices involve different skills and qualities to make their classroom more interesting. The presentation of the required things according to their subject related then the classroom setting would be more student-centered learnings. The skills presented in their teaching process and providing the emotions related to the teaching practices can give a better understanding of the subjects.

In these schools, teachers tried to use the ICT settings in their classroom but due to some barriers in integrating ICT in the classroom and the teaching procedures might not be effective. The students agreed that they are more engaged i.e., classroom teaching. The students expressed their feeling before having the tools and technologies in their teaching processes.

The A1 and A2 from AS said, *the teachers bring their notes and books and recite their contents and we all listen and to their teachings. But after teachers bring the laptop in the classroom and show us in the laptop and projector in some study contents or take us to the computer lab to show about the subjects. They encourage us to ask questions related to the subject and it makes it more interesting, and we get clear ideas about it.*

The B1 and B2 from BS said, *the teacher motivates us and tries to show the computers with the help of the projector, but the load shedding and the internet problems make our classroom silent. Even though we are many in the classroom the teachers make the group and gives us the chance to see in his laptop by turn but on the limited subjects.*

The BT from BS said, *the students look more interested when I teach them from the laptop and take them to the computer lab. This makes them more encouraged, and I sometimes show them related videos and contents on the laptop and the computer, but many students cannot see together at the same time and it is time-consuming to show them personally.*

#### **5.4.h Digital Divide and Gap in the Government Schools**

According to the Nepal Telecommunication Authority (NTA), around 53 % of the total population has the access to the internet in Nepal with both the internet and data users. The

data also shows that the use of mobile and internet penetration in Nepal has reached 85.86 % and 29.78 % respectively from the data collected in 2014. From the data of the Economic Survey of Nepal (2066/67 & 2067/68), the Government of Nepal has the provision of the infrastructures and the internet facilities to around 785 schools.

In this research, there is more focused on the government schools and the factors related to them. In this study, while observing the government schools, the status of the ICT settings in the schools and infrastructures are the primary concern of the digital divide. Besides that, the economic, geographical, cultural, and languages are the additional barriers to the digital divide.

As discussed in the early chapter, the factors, and barriers for integrating ICT and the aspects that pull behind the ICT to the digital divide. The teachers from both schools agreed on the fact that the rural schools and the people living in the rural areas are less likely to have access to the internet, phone lines, and other tools and technologies to the urban areas. The population density, services provision, physical infrastructures development, economic resources, and mobilization are the factors hampering the government schools' facilities in Nepal.

The AT from AS said, *the facilities provided in the urban areas are far more than the rural areas. The government provides the facilities in the equity but due to not proper mobilize of the resources the rural areas schools are facing obstacles in integrating the ICT in their teaching processes.*

The AH from AS said, *due to various reasons there is a gap of information and knowledge between the people of the rural and the urban areas in integrating ICT in the school curriculum. Even though there is the provision of some sort of infrastructures in the schools but still there is a lack of digital settings in the schools.*

The BT from BS said, *the government provides computers, projectors, internet facilities to most of the regions of the nation but there is still lacking a better system even in the city areas in the country than what we expect in the rural areas in the country. Along with that most of the teachers in the country do not want to go to the rural schools to teach as they know there is a lack of facilities and they try to settle in the city schools where they have easy access. Even though they go to teach in rural areas then the lack of students in the classes makes the situation worse.*



The BH from BS said, *the situation of the difference between the teachers and the students in ICT in the teaching and the learning process. Social inequalities like gender, age, caste, and race are the factors that make the digital divide in a country like Nepal where it is a multicultural, multilingual nation.*

Even with that, the lack of the skills of the teachers with the ICT integration in their teaching, utilizing the digital devices and webpages along with their curriculum and their study materials which are in the English language which also might be challenging for the multi linguistics population.

The students are from a different social structural background where they have different mother tongues than English and Nepali. With such a situation the students having all the study curriculum in the English and Nepali would be very challenging in their learning process.

The A1 from AS said, *there is a different language used in my home and my school, there speaks Nepali and in the study time, they speak English. It is very difficult to interact with the teacher and with the other students in the classroom. It was harder at an early age but now I can speak all these languages and understand it.*

The AT from AS said, *the students are from a different ethnic background and while teaching them in the digital settings in the classroom they hardly understand the contents. Also providing the educational materials and the curriculum in their language is a very challenging job for the government of Nepal as they are facing problems in implementing the applications and websites in the English language or localizing it.*

To fill the gap of the digital divide, there have been some steps taken by Mahabir Pun in the Nepal Wireless Networking Project in some parts of rural areas in Nepal. The schools and the teachers who have the better infrastructures and internet facilities and the children can learn in the digital settings but in the rural areas of Nepal, the students are still lacking the teachers and their classes. The students in the rural areas hardly get the teacher and the presence of teachers in the classroom is very often. There is no supervision and monitoring of the schools in the rural areas by the governmental bodies and the Ministry of education. Pun's mission is to widen the knowledge and information and to help people in the rural areas to expertise in digital learning.

The BH from BS said, *the stereotypes about the technologies for boys rather than girls and women. The Nepalese society views the girls and women and access to technology and the tools less to them and more to the boys as the patriarchal society. Along with that, I tried to set up the digital settings in the school as in our time there were no internet things in the schools. Now, most of the jobs in the world are online and this is a very essential issue to integrate into our teaching and learning practices. Furthermore, I try to send the teachers to the trainings and programmes to build their skills in providing the quality teachings.*

The AH from AS said, *to reduce the digital divide the teachers and students should be prioritized with the digital skills in collaborating in their contents of learning in the ICT subjects.*

*Along with it, the AH from AS added, for the students, schooling might be the first opportunity to expose children to innovations and to learn and use the literacy and multimedia technologies to their fullest. This encourages the students and teachers to have the right access to professional knowledge and digital education in schools and to take advantage of technologies and digital resources by way of training programmes.*

In general, to illustrate the digital divide and the gap in the formal governmental schools in Nepal highlights not only differences in the physical infrastructures like tools and technologies which can be brought up with the selective investments in such technologies. The learning capabilities of the students and their self-learning ability is the factor to decrease the gap of the digital divide. Connecting with the social constructivism theory, the student's cognitive skills emphasized and perceptions about their roles in integrating ICT in their ability for independent learning. The students discuss with their peer groups to solve the queries regarding their studies. The students with their initial learning from themselves but to have more information and knowledge the students consult with the teachers or they stuck with a problem even though discussing with the peer interaction.

In the ZPD process, the teachers or the mentor uses the technologies and the tools, and other knowledge and methods that raise the potentiality of the students from their initial learning to maximize their information and ideas from their pedagogical practices. With this research, the

use of ICT in the pedagogy, the initial and the actual situation of the students with their self-learning, and the use of digital technology for their teaching and learning process could move the students in ZPD.

## **5.5 Summary**

This chapter emphasizes the perceptions of the teachers and the students and the uses of ICT in the teaching and the learning process in the government schools of Nepal.

This study shows that the status of the ICT in government schools is generally not a sign of practical uses in the schools. The schools may have the limited ICT settings and the restriction to the students along with the numerous digital tools and technologies limited to the teachers and the school administration purposes.

In this research, the observation and the interview methods indicate and highlight the students' and teachers' perceptions about the ICT settings in the schools and their classroom and their course curriculum. I have pointed out some topics which highlighted the teachers and student's contemporary situation in the government schools. With this, how the students perceive the digital learning in the schools and teachers along with their pedagogical practices in digital settings in the classrooms.

## **CHAPTER VI: DISCUSSION OF THE FINDINGS**

After preceding these research chapters, the study findings will explore those findings concerning the critical theoretical viewpoints covered in the previous chapters. This chapter will also attempt to answer all the research questions in the sequence in which they are presented, together with the literature review and the theoretical underpinnings of ICT and education related to government schools.

### **6.1 The understanding of how teachers collaborate the ICT in the teaching process**

In this research, the question arises with 'how' to give a clearer vision on the research question with its purpose of using ICT among the teachers and the students as suggested in the user perspectives by Hill (2004:443-448). It gives a clear idea about the status of the ICT in the government schools with regards to the learning with, learning from, and learning through aspects as suggested by Hill to present the relation of teaching and learning processes.

After researching with the teachers and students to find out the status of ICT in the governmental schools with connecting to the governmental policies and documents from the Ministry of Education where there are documents of policies in the schools to share with teachers. There is also the provision of ICT in the government document which is more important to grab the opportunity to teachers and students for their better learning.

The government policies and plans reveal the continuing shifts to the policy implementation and improvements. In contrast, while conducting this study, the interviews and the observation give the findings visibility into the differences in the policies and the implementation of such policies in the education system in Nepal. The conclusions of the research emphasize that the governmental policies appear to be materialization. Within this study acquired from the research methods tools like observation and interviews of the teachers and the students along with the governmental policies and plans documented in this research came out with these significant aspects encourage the investigation into the ICT settings in the governmental schools in Nepal.

This research study indicates that resources and technologies available in the government schools do not reflect that which has been used. The tools and technologies brought to utilize

in the schools and the children may have minimal and restricted access to them. In contrast, the multiple digital instruments provided and held overall responsibilities to the school's staff, teachers, and administration. The government provides all such tools and resources to upgrade pedagogical practices, but such resources are kept without much functionality.

The Government of Nepal formulated various policies and plans regarding the ICT in Education to integrate the ICT into the education system. As discussed in the policy documents, under the 'Education for All' program, the Nepal government implemented the Formative Research Project 2004- 2009. As a result, the Ministry of Education handed over to the 62 schools with computers and printers. It has also stated that NGOs also played along with trust and individuals granted technological support to some schools to have the computer skills for the teachers in their pedagogical aspects. Furthermore, some NGOs in Nepal initiated the ICT learning materials for the junior students, including grades 2 to 6. The materials based on the subjects related to Nepali, Mathematics, English, and Science.

The National policies aspire in the Education in ICT, Master Plan 2013- 2017 with the ambition to grow ICT into the schools without a strategic plan and effective implementation of ICT for the facilities of schools and teachers. Some programs explore the Ministry of Education and the Department of Education provided technologies for the schools to brought up the schools for the proper conduction of their programs with digital settings. The Ministry of Education under the Government of Nepal had launched their official websites in each Development region of five regions and the Department of Education (DOE) in all of 75 districts. With such implementations, they were the one Laptop per Child (OLPC) pilot project in some selected 26 schools in six districts in Nepal.

The School Sector Development Plan 2016- 2023 also emphasizes the ICT settings in the schools and integrates the Nepal education curriculum into the global community and helps the citizens be involved in the technological world. They propounded the Lab Model projects where the computer shared in some cities; Internet facilities access to the District Education Offices (DEO) and some schools with the matching funds provided and the computer labs with the internet facilities from the local providers.

Even after formulating policies and plans, there is still a lack of ICT in the teaching and learning practices and limited only to the documents in the government schools of Nepal. Therefore, it

can be saying that the government took the initiation but still has so much to do effectively in the government schools of Nepal.

## **6.2 Examine the factors that contribute to integrate the ICT in the government schools of Nepal**

With this technological era, the Government of Nepal continues to face various challenges in collaborating the ICT into the pedagogical process whether in an educational curriculum or the instructional techniques, and in enhancing lifelong learning abilities. This part will highlight the factors that caused this research and mentioned in the literature review in integrating ICT in schools.

### **6.2.1 Inadequate Infrastructure**

The government provided the tools and technologies to the schools but there still lacks many digital instruments even to run a standard ICT setting in the schools. Moreover, the students do not have sufficient access to devices like computers and the unstable power supply and internet facilities in the schools, which deprived them of developing their skills and qualities. The Government of Nepal formulated various policies and plans regarding the ICT in Education to integrate the ICT into the education system. As discussed in the policy documents, under the 'Education for All' program, the Nepal government implemented the Formative Research Project 2004- 2009. As a result, the Ministry of Education handed over to the 62 schools with computers and printers. It has also stated that NGOs also played along with trust and individuals granted technological support to some schools to have the computer skills for the teachers in their pedagogical aspects. Furthermore, some NGOs in Nepal initiated the ICT learning materials for the junior students, including grades 2 to 6. The materials were based on the subjects related to Nepali, Mathematics, English, and Science.

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According to the World Bank, 2019 highlighted that some of the students of the developing nation can use the computer laboratory not so often which is not adequate to make them technological qualified. Ironically the situation of Nepal, the students in the schools are limited to such facilities. Teachers frequently work with ICT devices in schools and the classroom, but the students just observe at the computer or laptop what the teacher shows about the topic contents in their computer or the projector.

### **6.2.2 Time Consumption**

From my observation, the teachers use tools and technology in their pedagogical practices. However, the teachers are taking 5-6 classes a day and they do not have much time installing the tools and devices in each class. One of the main drawbacks that lead the ICT behind the teaching that teachers felt was the excessive number of their teaching classes and their time to prepare for their plans. Then they must cover all the absent courses and they don't have much time to prepare for such presentations and present in the classroom as they prepare their content in the earlier weeks and it will be new to the teachers for giving the classroom.

### **6.2.3 Teachers Trainings**

The government has provided teachers with training and they were involved in the e-learning training and programs. With such activity, the teachers should know well about the tools and technologies and utilize their teaching contents in the ICT settings and make the classroom more interactive. As a result, the students learning capacity based digital learning would

increases. But due to the inadequate and inefficient internet facilities and the lack of proper functioning of the computers in the computer labs hinder the teachers while using the digital tools in the teaching process would make the teachers feel frustrated in such settings.

#### **6.2.4 Monitoring and Evaluation**

There has seen a lack of supervision in ICT settings in schools and in the policy formulation which misses ground reality of the schools and formulates the policies from the Centre of the nation. Due to that the policies implemented from the top to bottom approach and maybe not having the proper grassroots level understanding of all schools which makes the education policies failed to implement in the country. From such interviews from the teachers, it shows a lack of proper communication and interaction towards the school's settings and ICT teaching and learning process effectively implementing in the schools between the schools and the Ministry of Education and the stakeholders.

#### **6.2.5 Lack of Financial Resources**

The study also indicates that the government documents are investing a huge budget to develop the ICT settings in the schools and their infrastructures, power supplies, internet facilities to improve the education and teaching practices. This research also shows that the low- or middle-class families cannot afford the private schools. The government schools provide such benefits like low or no tuition fees, schooling costs and, they give free books, copies, pen, and pencils to such families to encourage them to send their children to the school.

#### **6.2.6 Digital Teaching and Learning**

The student's problems solving capabilities and their digital learning from their abilities. If the students need support from their peer groups or the teachers, they should do for better understanding. This research reveals a divide and segregate the students and the digital settings in the schools. Even having the tools and technologies in the schools but the utilization and the control over such digital devices are in the hands of school authority and administration.

In the context of ICT, Bølgan, (2004) highlighted that it is seen as the contrary of creativity. Relating with this research content, there were connecting in many illustrations. In the government schools, the teachers involved in the ICT settings with lively examples were compared to the senior teachers who teach in the old traditional way. The training required to



those teachers had to go back as they are not that senior to the aged and the school priorities them to have such programs and it mostly can be seen in the schools teaching.

The students' creativity to learn in the digital settings was triggered and emphasizes the traditional teaching methods. The ICT settings and the digital learning process for the students might be the medium to learn and express their learning capabilities and their learning reflection in their studies. With such phenomena, this might be challenging in the government schools in the aspects of the time consumption for the teachers and the limitation of the resources to install and develop the ICT settings in the schools and their curriculum. With the examples shown in the previous chapters, this study illustrates the ICT settings in the public schools in Nepal along with the teacher's digital pedagogical skills and the student's learning and their ICT knowledge.

The inclusion of ICT in the curriculum can be seen as the different subjects at the higher level. Still, at the school level, the government could not introduce the primary subject in the curriculum and the pedagogical practices for the teachers and students to compete with the global skill workers.

### **6.2.7 School management system**

While observing and having an informal interview with some of the staff of the schools, they mentioned that they used to have written documents by hand like official letters, pay slips which were time-consuming. Now it is digital which made their life easier and time-saving. The teachers also focus on the SMC roles and responsibilities and highlight the implementation of ICT in the administration system and the school management team. For example, teachers and students' attendance and presence in their work were traditionally taken with pen and in the notebook. But with the government's new system to put the digital attendance to the teachers made the teachers and the staff come in time and leave after school.

### **6.3 The Perceptions of Teachers and Students and the Use of ICT in the Schools**

This third research question address the teachers' and the students' perceptions regarding the ICT in the government schools of Nepal. All the details regarding these topics mentioned in the literature review along with the theories.

Based on social constructivism, (Vygotsky, 1978) suggested that learning is a collective and collaborative process where the information and the knowledge are the outcomes of interacting between the people and the culture and their environment. He also reflects that each child's role in the cultural development occurs twice; first with the socio-cultural aspects and next within themselves, and their learning processes from the social interaction (inter-psychological) and the other is within the child (intra-psychological).

While taking the interviews, I realized that the students seem more comfortable with the students or teachers as the collective and collaborative process as they will express them without hesitation. Along with this, the teachers' traditional teaching concepts might encourage the students to have peer interaction. As a result, the students were more comfortable with each other. The teacher also gives time to the students to interact with each other and continue their classes.

The students' perspective on peer interaction stresses the notions of information and knowledge exchange through experiences mediated by peers or friends, with Lev Vygotsky emphasizing that learners cannot attain their full potential without the assistance of others.

In the social constructivism approach, learning is the integrated process and the inseparable aspects of the social order and practices (Lave & Wenger, 1991, p.31). It is the interaction with the peers, teachers in their environment. Learning practices occur within the interaction processes with the people where learners receive ideas and information in their everyday activities in the schools and from their environment. Students learn something from their own, some from their peers, and other people. The role of the headteacher is to mobilize the teachers in the interactions and participation in teacher training programs and make an environment in schools that generate and creates the learning environment and provides emotional support as well as encourage them to get more information and knowledge regarding the benefits of the teacher interactions.

The traditional teaching in Nepal especially in the Government schools is very much common in the teaching practices. It has the one-way teaching method as the teacher teaches and the students listen. However, by observing the scene of the Government schools in the urban is far better in most of the aspects as we compare to the rural area's government schools. However, they have very much difficult situation due to various elements like infrastructures, financial aspects, internet and electricity supply, skill manpower, geographical context, accessibility, etc.

As discussed in an earlier chapter, the factors, and barriers for integrating ICT and the aspects that pull behind the ICT to the digital divide. The teachers from both schools agreed that the rural schools and the people living in the rural areas are less likely to have access to the internet, phone lines, and other tools and technologies to the urban areas. In addition, the population density, services provision, physical infrastructures development, economic resources, and mobilization are the factors hampering the government schools' facilities in Nepal.

As Nepal is a multiethnic and linguistic nation, the students come from diverse socioeconomic and cultural backgrounds, and their mother tongues are distinct from English and Nepali. Therefore, the pupils' learning process would be significantly hampered if they were required to do all their coursework in both English and Nepali.

Mahabir Pun's Nepal Wireless Networking Project has taken some measures to close the digital divide in some rural regions of Nepal. Students in remote parts of Nepal lack access to professors and classrooms due to inadequate infrastructure and internet access. Students seldom have access to a teacher in remote regions, and instructors are rarely present at the school. Schools in remote areas are not supervised or monitored by the government or education ministry. People in remote regions can get skills in digital learning through Pun's aim of spreading knowledge and information.

Constructivism (Elliott, 2000, p. 256) explains the approach and learning method that encourage people to develop or create their understanding with the knowledge that relies on the learner's experiences. The theme of social constructivism is that the knowledge of human learning constructed and with that knowledge, the learners build the other knowledge topping with it. Philips (1995) based on this approach; the previous understanding of human beings will impact the new ones that people will build from acquiring knowledge.

From the social constructive point of view, (Postholm, 2005), the participants such as children are the active learners. They gather and gain knowledge through their learning process also by doing the interaction with other people. In this aspect, the knowledge, and the ideas that participants had about something cannot be constant where the learning is an active process. They might acquire more and different opinions and information that might change their perceptions of things, and it also changes their thinking patterns. This process will determine whether the learners will build up their knowledge based on their prior or passively absorbed knowledge.

(Dewey, 1938) interpreted the learning process as the social phenomena where it focuses on the interaction of or within the people (Såljo, 2001; Hansen, 2009) but not the abstract concept. The other writer Ernest (1994, p.8) adds up the ideas about the human-based understanding and the socially constructed knowledge which can be dynamic with time and the social interaction to fit into the ontological circumstances, where it does not have the actual image of it.

Vygotsky explained and explored social constructivism which adds up the theme to my research. The community plays an active role in influencing the children in their learning process and environment (Vygotsky, 1978) link with the factors that affect the children in their behaviors and thinking patterns. Therefore, the teaching and learning cognitive processes function to exchange and coordinate mutual information acquired from the environment. Relating the things mentioned in the different stages, In the Zone of Proximal Development (ZPD) process, the teachers use the technologies and the tools and other knowledge and methods that raise the potentiality of the students, from their initial learning to maximize their information and ideas from their teaching practices. With this research, the use of ICT in the pedagogy, the students' initial and actual situation in their self-learning, and digital technology for their teaching and learning process could move the students in Zone of Proximal Development.

Along with the social constructivism theory, Gladhart (2001) propound a Levels of Adoption Model by adapting the Apple Classrooms of Tomorrow (ACOT) which studied by Dwyer, Ringstaff, and Sandholtz (1992) highlights the issues related to the teachers and students' behaviors along with the tools and technology integration. These behaviors are classified into the five stages of computer technology integration. They are expressed to clear the teachers and students' behaviors in integrating ICT in teaching and learning processes.

### **1. Entry**

In this stage, the students are the primary learners where they trained to utilize the technology. With the help of technology, the students acquire ideas and information about it. In government schools, the children can see the tools and technologies, but they are not much familiar with them. Some students have used it at home or elsewhere but most of them don't have the experience of using it.

### **2. Adoption**

In this phase, the teachers are using the tools and the technologies that are supplementary supports for their manual teaching methods in a limited aspect to some power leading teachers. The government provides the teachers trainings and programs that are for the sake of their teaching skills, but the selection of the trainings is handled by the seniors' teachers where they have few years left in their teaching career. Encouragement to the young teacher is less seen with this research. Utilizing the ideas in the administration works, teachers personal work. In this part, teachers also encourage the students to use and mobilize their ICT skills in their teaching and learning process.

### **3. Adaption**

By adopting this phase, the teachers mobilize their skills of ICT in the classroom and its activities. With such phenomena, the teachers add up the study-related materials, but their teaching techniques would be the same. As there are still the same teachers who prefer traditional teaching methods with the digital world. There are many information searching sites and devices where they can use the online methods from the internet, compact disc, e-learning materials, etc. They integrate more with the traditional teaching methods than the digital ones. But the changes in the adaption from the traditional teaching towards the path of digital education can be seen partially.

### **4. Appropriation**

After getting trainings and information about the tools and technologies, the teachers start recognizing their skills and qualities and trying to build projects pre-eminent within their prospects by the opportunities offered by information and communication technology. The learners also continue their learning integrating the ICT tools and techniques to achieve their goals with high intelligence. The ICT and the technologies that are used in such teaching and learning processes a valuable means of instruments.

## 5. Invention

In this stage, the teachers continue to modify their teaching and learning methods by using the technology during their courses. From the traditional teaching methods to the digital teaching environment with different modules of teachings emerging in the governmental schools. A sign of positivity can be seen with the change in the policies in education and the teaching practices. Regarding the students, they are also mobilizing their fundamental and higher skills and qualities in the digital learning procedure.

Along with these theories used in exploring the use of ICT in the schools in teaching and learning process, The Learning theories also gives a clear insight about it. A Learning theory describes the different perspectives of the students to gather, perceive and retain information and knowledge within the learning process. As mentioned in the above research objectives and questions, it highlights the students and teachers learning and the teaching processes from the different socio-environment. In this process, an individual influenced the various socio-cultural, emotional, and environmental aspects in collaboration with the actual knowledge they constructed to play a vital role in understanding the whole issues related to change in the system.

The first category defines the learning from the method that explains the transmission of the information and the data to students with some media (Piaget 1954; in Hill et al 2004). Vygotsky also highlighted the zone of proximal development where the students get support and help from the teachers to reach and change their status from their actual knowledge and their constructed knowledge. Here in this view, the teachers play the role of the facilitator and transfer of knowledge to the students.

The second part explains the learning with a perspective where the learning process of the students and the teacher from the different medium is regarded as passive and focuses on the active creation of the learners(ibid). The dynamic learning process from perspective is a sign of knowledge between the teachers and learners (Perkins, 1986; Hill et al 2004). The students are getting familiar with the ICT settings and teachers are getting the trainings regarding the ICT and exchange of such skills and knowledge in the teaching process.

The last category defines learning through methods where the conversation occurs between the students and the teachers through digital technology. Furthermore, (Hill, 2004; Selwyn, 2007)

highlighted the creation of the learning procedures and experience generated with the online medium. The progress on digital literacy and the students learning are increasing with the improvement of Nepal's population using internet services even though it is low in the quantitative data, but it will consume time to reach the ideal phase. It is applicable to the higher level of students as the teachers send their course materials in the online medium. Due to various factors that are hampering the level of conversation and interaction in transferring between teachers and students. The tools and technologies are emerging soon in future but till date, it is still the drawbacks on ICT settings in the governmental school.

The discussion of the findings and related literature review can give more insight into this research. However, the use of Vygotsky's Social constructivism theory provides a clear vision connecting with the research topic about the ICT and its status in the government schools in Nepal. ICT integration into teaching and learning at Government schools is complicated by other variables than the features of innovation. Some of these factors are explored in the last research questions where the teachers' student's perceptions are explained in further detail with the context of the teaching and learning process in this section along with the constructivism.

## **CHAPTER VII: CONCLUSION AND RECOMMENDATIONS**

### **7.1 Conclusion**

This chapter aims to present the use of ICT in the teaching and learning process in the government schools of Nepal. It shows the relationship between the education policies of Nepal's education system and its implementation in the digital pedagogical approach. This chapter outlines the work of the Nepalese Government to implement ICT in education and the threats involved in its national initiative and policy implementation. Finally, it explores the use of technologies by the teachers and how technology facilitates their teaching practices in the classroom in contemporary schools in Nepal.

The government documents and evaluation findings accompanied by the observation and the interviews reveal that it does not yet practice teaching and learning in total flows in the government schools in Nepal in almost a decade. It might be time consuming to ensure the tools and the technologies in class activities due to numerous barriers like infrastructures, resources mobilization, socioeconomic aspects, etc. It is a positive signal for the governmental schools in the country to start utilizing the tools and technologies in education.

Along with the ICT settings, the school's curricula should be revised and updated accordingly and the infrastructures in the schools must be built to provide the teachers and the students with more access to the tools and the technology in their pedagogical practices. Even though with the time constraints, the teachers who have been teaching for many years should be prioritized. They should be given training and programs to cope with the technological teaching process than the new teachers who are familiar with the ICT settings to have the digital pedagogical practices from the traditional teaching and learning processes.

Although there are already some current hurdles that we noticed in the research. The existing problems facing to overcome cannot be solved as magically but it is the transformation and the transition of ICT into education is a continuous process that takes time to overcome and see the changes in social phenomena. It depends on the steps of the government and the Ministry of Education of Nepal to initiate the ICT learning platform effectively in the policy implementation to which it can achieve to integrate ICT in the government schools in Nepal.



Regarding this study, further research can be conducted out to examine the ICT collaboration in the pedagogical practices and impacts on the student's results. In specific, there can be done more research incorporating different factors affecting to integrate ICT in the digital pedagogical settings in the aspects of urban and rural government schools, various socio-cultural factors as Nepal are multi-cultural, multilingual, multi-ethnic with the economic barriers, the digital divide in government and private schools in Nepal.

There are many challenges in this area and schools must also be working on technology management, handling staff services, delivering power to institutions at daily interfaces, providing adequate software to topic students, arranging instruction and ICT-related awareness courses, building relevant devices such as CDs and DVDs based on school curricula, and facilitating each school.

## **7.2 Recommendations**

The respective recommendations are suggested to encourage and to develop ICT setting in the education in the government schools in Nepal.

With the policy and guidelines reforms, it is recommended that the Government of Nepal create an action strategy to provide educational institutions and teachers with ICT infrastructure and expertise and to promote the professional growth of their teachers on their pedagogical practices. Along with that, the policymakers should be actively coordinate to make the ICT policies effectively implemented. Regarding ICT as the compulsory subject should be included in the national curriculum from the primary level to the higher level to develop the skill human sources in ICT expertise. The GON also needs to collaborate and communicate with their local bodies along with their schools all over Nepal to implement the ICT policies in education.

It is also recommended that the government of Nepal should prioritize and give emphasis to facilitate the skilled human resources, the infrastructures. The physical constructions along with the power supply and the internet services should be maximized and improvised with the alternative solutions to tackle the barriers in future in enhancing the quality education. The tools and technologies for hardware resources, and the electronic facilitation software to the proper functioning to digitalize the government schools of Nepal. It is noticed that there is the provision of tools and technologies once or twice for the schools from different NGOs and INGOs, but the government should formulate policies to maintain such technologies and

identify the functioning tools for further usage, if not they have to replace such not functioning devices from the schools. Besides that, the GON also needs to provide the essential resources to mobilize the school's digital settings by providing the vital funds required to support and repair with ICT facilities maintenance properly.

The governmental teachers' professional development relies on traditional training that does not integrate the new technology in their teaching practices. So, the provision of the prerequisites and necessary skills and training incorporating ICT in the teacher's pedagogical training converted from the traditional teachers' training into the new pedagogical learning approaches should be required to qualify to teach their students with their digital skills and training. Regarding transforming the teaching and learning practices, the teachers play the vital role collaborating their teaching process with digital settings.

## REFERENCES

- Adam, M. S., Urquhart, C. (2007). *IT capacity building in developing countries: A model of the Maldivian tourism sector. Information Technology for Development*, 13(4), 315-335.
- Alam, M. M. (2016). *Use of ICT in higher education. The International Journal of Indian Psychology*, 3(4). doi:18.01.208/20160304
- Bates, T. (2000b). *Taking control: Managing teaching technologies: Strategies for college and university leadership*. San Francisco, CA: Jossey-Bass Publishers.
- Bølgan, N. (2006). *Temahefte om IKT i barnehagen*. Oslo: Ministry of Research and Education.
- Bølgan, N. (2004). *From IT to Tablet: Current Use and Future Needs in Kindergartens*. Oslo and Akershus University College
- Bhatta, S.D. (2005). *Determinants of Student Performance in the SLC Examinations. SLC Study Report # 13*. Prepared for the Ministry of Education and Sports, Kathmandu, Nepal.
- Bista, K. (2011). *Teaching English as a Foreign/Second Language in Nepal: Past and Present. English for Specific Purposes World*, 11(32), 1-9.
- Blumberg, B., Cooper, D. R., & Schindler, P. S. (2005). *Business Research Methods*. Berkshire: McGrawHill Education.
- Blurton, C. (2002). *New Directions of ICT-Use in Education*. [http://www.unesco.org/education/educ\\_prog/lwf/dl/edict.pdf](http://www.unesco.org/education/educ_prog/lwf/dl/edict.pdf); viewed 6 August
- Brooks, J. G., & Brooks, M. G. (1993). *In search of understanding: The case for constructivist classrooms*. Alexandria, VA: Association of Supervision and Curriculum Development.
- Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.

Bryman, A. (2012). *Social Research Methods 4<sup>th</sup> Edition*. New York, USA: Oxford University Press.

Bryman, A. (2016). *Social research methods (5th ed.)*. New York: Oxford University Press.

Bryman, A. (2015). *Social research methods*: Oxford university press.

Burns, N. & Grove, S. (2001). *The practice of nursing research: conduct, critique and utilization (4th ed)*. W. B. Saunders: Philadelphia, Pennsylvania, USA.

Burns, M. (2011). *Distance Education for Teacher Training: Modes, Models, and Methods*. Education Development Center, Inc. (EDC): Washington, DC.

Caddell, M. (2006). *Private schools as battlefields: contested visions of learning and livelihood in Nepal*. *A Journal of comparative education*, 36 (4), 463-479.

Caddell, M. (2007). *Private Schools and Political Conflict in Nepal*. In: Srivastava, Prachi and Walford, Geoffrey eds. *Private Schooling in Less Economically Developed Countries: Asian and African Perspectives*

Carm, E., & Acharya, S. (2016). *Gender awareness and pedagogical innovations in the introduction of open and distance learning (ODL) in Nepal*.

Carney, S. (2003). *Globalization, neo-liberalism and the limitations of school effectiveness research in developing countries; the case of Nepal*. *Globalization, Societies and Education*, 1 (1), 87-101.

Carney, S. , & Bista, M. B. (2009). *Community Schooling in Nepal: A Genealogy of Education Reform since 1990*, *Comparative Education Review*, 53 (2), 189-211.

Central Intelligence Agency - CIA. (2012). *The World Fact Books*. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/cq.html>

CBS. (2002). *Population Census, 2001 National Report*. Central Bureau of Statistics, Kathmandu, Nepal.

CBS. (2003). *Nepal in figures*. Central Bureau of Statistics, Kathmandu, Nepal.

CBS. (2011). *Nepal in figures*. Central Bureau of Statistics, Kathmandu, Nepal.

CBS. (2016). *Statistical Pocket Book Nepal 2016*. Nepal: National Planning Commission Secretariat, Central Bureau Statistics.

Central Bureau of Statistics. (2013). *Nepal in Figure, 2013*. Thapathali, Kathmandu: Nepal Planning Commission Secretariat.

Chakrabarty, S. N. (2013). *Best Split-Half and Maximum Reliability*. *IOSR Journal of Research & Method in Education*, 3(1), 1-8.

Christensen, M. C., Horn, B. M. & Johnson, W. C. (2008). *Disturbing Class: How Disruptive Innovation Will Change the Way the World Learns*. USA: McGraw-Hill.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). London: Routledge.

Cohen, L., Manion, L., & Morrison K. (2007). *Research Methods in Education*. (6th Ed.) Routledge. Taylor & Francis Group. London and New York.

Communication, M. o. (2015). *National Information and Communication Technology Policy*. Singha durbar, Kathmandu, Nepal: Government of Nepal.

Cox, J. (2019). Technology in the Classroom: The Benefits of Smart Boards. Retrieved from <https://www.teachhub.com/technology-in-the-classroom/2019/10/technology-in-the-classroom-the-benefits-of-smart-boards/>.

Creswell, J. W. (2005). *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research* (2nd Ed.). Pearson Merrill Prentice Hall.

Creswell, J., W. (2012). *Research Design Qualitative, Quantative and Mixed Method Approach* 3<sup>rd</sup> Edition. New Delhi: Sage Publication India PVT. LTD.

Cresswell, J.W (2014): *Research Design. Qualitative & Mixed Method Approaches*. London: Sage

Copple, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs*. Washington, DC: National Association for the Education of Young Children.

Daniels J.S. (2002): "Foreword" in *Information and Communication Technology in Education—A Curriculum for Schools and Programme for Teacher Development*. Paris: UNESCO.

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research* (Vol. 4th). Thousand Oaks: Sage.

Department of Education. (2009/10). *Flash report I 2009/10*. Sanothimi

Dewey, J. (1938) *Experience and Education*. New York: Collier Books.

Dhital, H. (2018). *Opportunities and Challenges to Use ICT in Government School Education of Nepal*. *International Journal of Innovative Research in Computer and Communication Engineering*, 6(4), 3215- 3220.

Dilas, D. B. (2018). *Education in Nepal*. Retrieved from wenr.wes.org: <https://wenr.wes.org/2018/04/education-in-nepal>

Douglas, B.( 2015): *The Theory and Practice of Development Education: A Pedagogy for Global Social Justice*. New York: Routledge. 222 pp

Driscoll, M. (2000). *Psychology of Learning for Instruction*. Boston: Allyn& Bacon

Duffy, T., & Cunningham, D. (1996). *Constructivism: Implications for the design and delivery of instruction*, *Handbook of research for educational telecommunications and technology* (pp. 170-198). New York: MacMillan.

Dwyer, D., Ringstaff, C., & Sandholtz., J.H. (1992). *Innovation and interaction: The relationship between technological innovation and collegial interaction* [Apple Classrooms of tomorrow Report No. 13]. Apple Computer.

Eady, M. J. & Lockyer, L. (2013). *Learning to Teach in the Primary School*. Brisbane: Queensland University of Technology.

Education for All. (2004- 2009). Kathmandu, Nepal: The Ministry of Education and sports.

Education for All (2015). *Ministry of Education and Sports Nepal National Commission for UNESCO in Collaboration with UNESCO*, Kathmandu, Nepal.

Elliott, S.N., Kratochwill, T.R., Littlefield Cook, J. & Travers, J. (2000). *Educational psychology: Effective teaching, effective learning* (3rd ed.). Boston, MA: McGraw-Hill College.

Ernest, P. (1994). *Varieties of constructivism: Their metaphors, epistemologies, and pedagogical implications*. Hiroshima Journal of Mathematics Education, 2(1994), 2.

Farrell, G., & Wachholz, C. (2003). *Meta-survey on the use of technologies in education in Asia and the Pacific*. Bangkok, Thailand: Asia Pacific Regional Bureau for Education, UNESCO.

Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks*. Luxembourg: Publications Office of the European Union

Fox, R. (2001). *Constructivism examined*. Oxford review of education, 27(1), 23-35.

Frønes, I. & Haldar, M. (eds.) (1998). *Digital barndom*. Oslo: Gyldendahl

Gall, M., Gall, J., & Borg, R. (2007). *Educational research: An introduction* (8th ed.). New York, NY: Pearson Education.

Gay, L. R & Airasian, P. (2004). *Educational Research: Competencies for Analysis and Application*; Upper Saddle River, New York. Merrill Prentice Hall.

Gladhart, M. (2001). *Models*. Retrieved September 13, 2004, from <http://education.wichita.edu/m3/models/teachered/integrationgrid.htm>

Ghavifekr, S. & Rosdy, W.A.W. (2015). *Teaching and learning with technology: Effectiveness of ICT integration in schools*. International Journal of Research in Education and Science (IJRES), 1(2), 175-191.

Gulati, S. (2008). *Technology-enhanced learning in developing nations: A review*. International Review of Research in Open and Distance Learning, 9(1), 1-16.

Hansen, J.E., Alvestad, M. (2018). *Educational language practices described by preschool teachers in Norwegian kindergartens*, European Early Childhood Education Research Journal, 26:1, 128-141, DOI: [10.1080/1350293X.2018.1412052](https://doi.org/10.1080/1350293X.2018.1412052)

Hefzallah, I. M. (2004). *The new educational technologies and learning: Empowering teachers to teach and students to learn in the information age (2<sup>nd</sup> ed.)*. Springfield, IL: Charles C Thomas Publisher Ltd.

Hill, J. R., Wiley, D., Nelson, L. M., & Han, S. (2004). "Exploring Research on Internetbased Learning: From Infrastructure to Interactions". In D. H. Jonassen (Ed.) *Handbook of Research in Educational Technology* (pp. 433-460). New York: Erlbaum.

Honebein, P. C. (1996). *Seven goals for the design of constructivist learning environments*. *Constructivist learning environments: Case studies in instructional design*, 11-24.

Hughes, P. (2001). *Paradigms, methods and knowledge*. In Mac Naughton, G., Rolfe, S. and Siraj-Blatchford, I. (eds.) *Doing early Childhood research* (pp. 31-55). Buckingham: Open University.

Jones, S., & Cresse, E. L. (2001). *E-education: Creating partnership for learning*. Melbourne, VIC: School of Information Management, RMIT University, 1-16.

Joshi, M. R., & Manandhar, H. (2017). *SMART CITY IN NEPAL: CONCEPT AND INDICATORS*. Kathmandu, Nepal: Government of Nepal Ministry of Urban Development Department of Urban Development and Building Construction NewTown Project Coordination Office.

Kaplan, B., & Maxwell, J. A. (1994). *Qualitative Research Methods for Evaluating Computer Information Systems*. In Second Edition, In *Evaluating the Organizational Impact of Healthcare Information Systems*(pp.30-55). New York, Springer Science.



Klein, H. K., & Myers, M. D. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly*, 23(1), 67-93.

Kothari, C. R. (2007). *Research Methodology: Method and Techniques*, New Delhi, India.

Kreps, D. & Kimppa, K. (2015). *Theorising Web 3.0: ICTs in a Changing Society. Information Technology & People*, 28(4), 726-741.

Lave, J. & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press

Laurillard, D. (2012). *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology*. New York: Routledge.

Lichtman, M. (2013). *Qualitative research in education: a user's guide*. London; Los Angeles: SAGE Publications.

Liu, C. C (2010). *Evolution of constructivism, Contemporary Issues in Education Research*, 3(4), 63-66.

Ministry of Education of Nepal (MOE). (2010). *Ministry of Education: A Glimpse. Monitoring, Evaluation & Supervision Division*, Kathmandu, Nepal.

Ministry of Health and Population. 2013. *Nepal Population Report 2013*. Ramshah Path, Kathmandu, Nepal.

MoES, (2005). *National Curriculum Framework for School Education (Pre-primary – 12) in Nepal*. Sanothimi, Bhaktapur: Ministry of Education and Sports, Government of Nepal.

MOIC (2015): *National Information and Technology Policy, Ministry of Information and Communication*, Singh Durbar, Nepal

Morgan, K., Morgan, M., Johansson, L. & Ruud, E. (2016). *A systematic mapping of the effects of ICT on learning outcomes*. Oslo.

National Planning Commission, (2016). *The Millennium Development Goals: Final Status report 2000- 2015*. Government of Nepal, National Planning Commission, Kathmandu, Nepal.

Nepal, G. O. (2013). *Information & Communication Technology (ICT) in Education Master Plan 2013-2017*. Kathmandu, Nepal: Ministry of Education.

Neuman, W. L. (2006). *Social research methods: qualitative and quantitative approaches*. Boston: Pearson A and B.

Neuman, W. L. (2011). *Social research methods. Qualitative and quantitative Approaches*. (7<sup>th</sup> ed.). Pearson Education Inc.

NIRT (2016). *Nepal Education Sector Analysis*. Kathmandu, Nepal

Oh, C. H. (2003). *Information communication technology and the new university: A view on eLearning*. *The ANNALS of the American Academy of Political and Social Science*, 585(1), 134-153.

Oliver, K. M. (2000). *Methods for developing constructivism learning on the web*. *Educational Technology*, 40 (6)

Oliver, R. (2002). *The role of ICT in higher education for the 21st century: ICT as a change agent for education*. *Proceedings of the Higher Education for the 21st Century Conference*. (pp. 1-8). Miri, Sarawak: Curtin University.

Pelgrum, W. J. (2001). *Obstacles to the integration of ICT in education: results from a worldwide educational assessment*. *Computers & Education*, 37, 163-178.

Phillips, D. C. (1995). *The good, the bad, and the ugly: The many faces of constructivism*. *Educational researcher*, 24(7), 5-12.

Piaget, J. (1954). *The construction of reality in the child*. (M. Cook, Trans.). Basic Books. <https://doi.org/10.1037/11168-000>

Postholm, M. B. (2005). *Kvalitativ metode: En innføring med fokus på fenomenologi, etnografi og kasusstudier*. Oslo: Universitetsforlaget

Punie, Y., Zinnbauer., & Cabrera, M. (2006). *A review of the impact of ICT on learning. Working paper for DG EAC*. Retrieved from <http://ftp.jrc.es/EURdoc/JRC47246.TN.pdf>

Prensky, M. (2001) *Digital Natives, Digital Immigrants - A New Way To Look At Ourselves and Our Kids*. Retrieved September 6, 2020, from <http://www.marcprensky.com/writing/> In Hansen,L.I.(2009). *We just click, ICT from preschool children´s perspectives* (master´s thesis, Oslo University College, Norway) Retrieved from [https://oda.oslomet.no/oda-xmlui/bitstream/handle/10642/297/Hansen\\_LivInger2.pdf?sequence=2&isAllowed=y](https://oda.oslomet.no/oda-xmlui/bitstream/handle/10642/297/Hansen_LivInger2.pdf?sequence=2&isAllowed=y)

Pvt.Ltd., T. V. (2016). *A Study on the Use of Information Communication Technology (ICT) and Its Sustainability in School Education* . Sanothimi, Bhaktapur, Nepal: Department of Education.

Rana, K. B. M. (2010). *Strategies for Pre-service Secondary English Teacher Development in the UK*. *Journal of NELTA*, 15(1-2), 134-145. doi: <http://dx.doi.org/10.3126/nelta.v15i1-2.4619>

Rana, K. B. M. (2018). *ICT in Rural Primary Schools in Nepal: Context and Teachers´ Experiences* (Doctoral dissertation, University of Canterbury), Christchurch, New Zealand. Retrieved from <https://ir.canterbury.ac.nz/handle/10092/15166>

Ranjit. K. (2005). *Research methodology: A step by step guide for beginners*. 2<sup>nd</sup> Edition Singapore, Pearson Education.

Robson, C. (2011). *Real World Research: A Resource for Users of Social Research Methods in Applied Settings*, (2nd Ed.). Sussex, A. John Wiley and Sons Ltd.

Sarfo, F.K., Amankwah, S.K., , Agyen,O,P., and Yidana, I.(2016). Information and communication technology access and use and competency level among second-cycle school teachers in Ghana.*Academic Journals*. Vol. 8(5),pp.43-51. doi: 10.5897/JMCS2016.0495

Selwyn, N. (2007). *The use of computer technology in university teaching and learning: A critical perspective*. *Journal of Computer Assisted Learning*, 23, 83-94. doi:10.1111/j.1365-2729.2006.00204.

Sidorenko, A., & Findlay, C. (2001). *The digital divide in East Asia*. *Asian-Pacific Economic Literature*, 15(2), 18-30.

Säljö, R. (2001). *Läring i praksis. Et sosiokulturelt perspektiv*. Oslo: Cappelen

Statistics Norway (2008a). *Children in kindergartens. Final figures, 2007*. Retrieved January 11, 2009, from [http://www.ssb.no/english/subjects/04/02/10/barnehager\\_en/](http://www.ssb.no/english/subjects/04/02/10/barnehager_en/)

Tam, M. (2000). *Constructivism, Instructional Design, and Technology: Implications for Transforming Distance Learning*. *Educational Technology and Society*, 3 (2).

Tinio, V. L. (2000). *ICT in education. Asia-Pacific development information programme: UNDP*. Retrieved from <http://www.apdip.net/publications/iespprimers/ICTinEducation.pdf>

Transcend Vision Nepal (TVN) Pvt. Ltd., 'A Study on the Use of Information Communication Technology (ICT) and Its Sustainability in School Education', Bhaktapur-Nepal, 2016.

Ukpe, E. (2016). ICT in Education: Catalyst for Economic Growth in Nigeria. *International Journal of Education and Research*, 1-6.

UNESCO. (2015) *Global Monitoring Report 2000-2015: Achievements and Challenges*. EFA Global Monitoring Report, Retrieved from: <https://unesdoc.unesco.org/search/2d5141d9-b675-4b7e-b18e-fa297ff65b69>

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wims, P., & Lawler, M. (2007). *Investing in ICTs in educational institutions in developing countries: An evaluation of their impact in Kenya*. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 3(1), 5-22.

Woodhead, M. (2005). *Early Childhood Development: A Question of Rights*. *International Journal of Early Childhood*, 37 (3), 79 – 95. In Woodhead, M., & Faulkner, D. (2008). *Subjects, objects or participants? Dilemmas of psychological research with children*.

The World Bank, (2019): The Education Crisis: Being in School is not the same as Learning. Retrieved from <https://www.worldbank.org/en/news/immersive-story/2019/01/22/pass-or-fail-how-can-the-world-do-its-homework>

Yin, R. K. (2009). *Case study research: design and methods* (4th ed.). London: Sage Publications.

# Appendices

## Interview Guides for Students

Objectives setup as the theme around research questions.

### Icebreakers

### Basic Information

### Introductions

Do you know something about Information and Communication Technology (ICT)?

What things do you have in your classroom?

1. Do your teachers use technologies in classroom teaching?  
If yes, how often they use technologies?
2. In which subject, teachers use technologies more?
3. What do you think ICT would help you to understand the lessons or topics?  
If yes, how does it help you?
4. How often do you get the opportunity to use the ICT in school?
5. Can you figure out the differences between ICT based classes and the classes with manual methods?  
What are the main differences?
6. Which methods do you like most and why?
7. Do you use technologies outside of schools?  
  
If yes, in what purpose?
8. Which devices do you use most for searching information?

9. How often you use mobile?

10.

11. Do you think ICT is helping you on education?

If yes, how is it helping?

If not, why not?

12. Does your head teacher or the school authority visit your classes regularly?

If yes, do they ever say anything about using ICT in classroom?

13. Any suggestions or recommendations regarding this topic?

## **Interview guide for the Teacher**

1. What do you know about technologies that you use in classroom?
2. How and when do you prepare yourself for using the technologies in classroom?
3. What is your objective on using ICT in classroom?
4. How did you learn to use ICT in teaching?
  - a. Did you get any training? If you get training, who conducted it?
  - b. What was the aim of it? Do you have any comments about it?
5. In which type of lesson, you use ICT usually?
  - a. How many times in day/weeks?
6. Are there any chances for students to use technologies in classroom?
  - a. For what they use the technologies?
  - b. How you guide them on using ICT in classroom?
7. Have you found any differences before and after starting ICT in classroom?
  - a. Is there any effect of using ICT in classroom? If yes, what are they?
8. Do the ICT help students to understand the topic easily? How did it happen?
9. Do you know the ICT policies that Government of Nepal is implementing with regards to integrate the school policies?
10. Have you faced any challenge on integrating ICT in your teaching? If yes, what are those?
11. Do you have any recommendation on ensuring ICT in schools to government?



12. How can ICT play more effective role in the school education of Nepal? What is your view?

13. Any suggestions or recommendations regarding this topic?

## **Interview guide for the Head Teacher**

1. What do you know about technologies that you use in your school?
2. How and when do you prepare yourself for using the technologies in your school?
3. What is your objective on using ICT in classroom and in your whole school?
4. How did you learn to use ICT in teaching?
  - c. Did you get any training? If you get training, who conducted it?
  - d. What was the aim of it? Do you have any comments about it?
5. In which type of lesson, you use ICT usually?
  - b. How many times in day/weeks?
6. Are there any chances for students to use technologies in classroom?
  - c. For what they use the technologies?
  - d. How you guide them on using ICT in classroom?
7. Have you found any differences before and after starting ICT in classroom?
  - b. Is there any effect of using ICT in classroom? If yes, what are they?
8. Do the ICT help students to understand the topic easily? How did it happen?
9. Do you know the ICT policies that Government of Nepal is implementing with regards to integrate the school policies?
10. What sorts of policies do your schools have regarding ICT? Are you following the GON ICT policies, or you have your own policies?
11. Have you faced any challenge on integrating ICT in the school? If yes, what are those?

12. Do you have any recommendation on ensuring ICT in schools?
  
13. How can ICT play more effective role in the school education of Nepal? What is your view?
  
14. Any suggestions or recommendations regarding this topic?