Quality Enhancement in Education:
Integration of ICTs into the School Classrooms

A Mini Research

Submitted to

The Eternal Examiner

Dhankuta Multiple Campus, Dhankuta

Research Management Cell

Submitted by

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पत्र संख्या :
चलानी नम्बर :

सम्झौता पत्र

धनकुटा बहुमुखी क्याम्पस, धनकुटाको अनुसन्धान व्यवस्थापन एकाइद्वारा २०७६ सालमा सञ्चालन गरिने लघु अनुसन्धान परियोजना प्रयोजनका लागि तपाईं अङ्ग्रेजी शिक्षा विषयका उपप्रा. श्री अम्बिकाप्रसाद पौडेलले अनुसन्धान व्यवस्थापन एकाइ, धनकुटा बहुमुखी क्याम्पस, धनकुटामा प्रस्तुत गर्नुभएको **Quality Enhancement in Education: Integration of ICTS in the School**शीर्षकको लघु अनुसन्धान प्रस्ताव मूल्याङ्कन समितिद्वारा अनुसन्धानका लागि उपयुक्त ठहऱ्याई सिफारिस गरेको हुँदा तपसिलका सर्तहरूका अधीनमा रहने गरी अनुसन्धान गर्ने धनकुटा बहुमुखी क्याम्पस, धनकुटा र तपाईं उपप्रा. श्री अम्बिकाप्रसाद पौडेल बिच यो करार सम्झौता गरिएको छ ।

तपसिल

१) स्वीकृत लघु अनुसन्धान प्रस्तावमा उल्लिखित शीर्षकमा मात्र अनुसन्धान कार्य गर्नुपर्नेछ ।
२) यो करार सम्झौता भएको मितिले अधिकतम तीन महिनाभित्र लघु अनुसन्धान कार्य सम्पन्न गरिसक्नुपर्नेछ ।
३) सम्पन्न भएको अनुसन्धानको प्रतिवेदनको इकपी र हार्ड कपी १/१ प्रति अन्तिम मूल्याङ्कनका लागि यस क्याम्पसमा अनिवार्यरूपमा पेस गर्नुपर्नेछ ।
४) अन्तिम मूल्याङ्कन मौखिक परीक्षाबाट हुनेछ ।
५) मौखिक परीक्षाबाट अनुसन्धान प्रतिवेदन उपरका परिष्कार परिमार्जन विषयक प्राप्त सल्लाह सुझावहरू कार्यान्वयन गरी अन्तिम प्रतिवेदनको इकपी र व्यान्डिड गरेको हार्ड कपी ३ प्रति मौखिक परीक्षा सम्पन्न भएको मितिले १५ दिनभित्र क्याम्पसमा बुझाउनुपर्नेछ ।
६)अनुसन्धान कार्य सम्पन्न गर्ने क्याम्पसबाट जम्मा २ किस्तामा रु २०००० अक्षरेपी बीस हजार मात्र (करसहित) उपलब्ध गराइनेछ ।
७) अनुसन्धानको प्रस्ताव मूल्याङ्कन तथा मौखिक परीक्षा बापत लाग्ने खर्च स्वयम् अनुसन्धाताले पाउने रकमबाट कट्टा गरिनेछ ।

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(उपप्रा श्री अम्बिकाप्रसाद पौडेल)
अनुसन्धाता

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(सहप्रा. श्री होमबहादुर बस्नेत)
क्याम्पस प्रमुख

मिति : २०७६/०९/०१

क्याम्पस प्रमुख

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Evaluation and Approval

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Being participated in the mini research project-2019 conducted by Research Management Committee Dhnakuta Multiple Campus, this mini research report entitled **Quality Enhancement in Education: Integration of ICTs into the School Classrooms** presented by Ambika Prasad Poudel, a lecturer in English education, and carried out from 20th December 2019 to 18th March 2020, has been approved after evaluation by following evaluation and approval committee.

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Abstract

This study entitled "Quality Enhancement in Education: Integration of Information and Communication Technologies (ICTs) in the School Classrooms" was a wonderful experience to me of carrying out a research work in one of the more relevant issues of present world " ICTs in education". The main objective of this research was to study the current status of the ICT infrastructures and their use by the teachers in the school classrooms. The study was also an attempt to explore the achievement of Information and Communication Technology in Education Master Plan (ICTEMP) 2013-2017 which was implemented by the Government of Nepal with an aim to improve ICT infrastructures development and their integration in school education.

This study adopted quantitative approach of research selecting 60 schools from Morang district, Nepal, using stratified random sampling methods. 60 English language teachers from those randomly selected schools were the participants in the study and a survey-based questionnaire was used as the research tool. The data collected were analyzed using descriptive and inferential statistics. The findings were that still majority of the schools were unable to run ICT-integrated education due to the lack of basic ICT-infrastructures. More importantly, the number of the teachers who used ICTs in the classroom was lower than the number of the schools where basic ICTs were available. It meant that quality enhancement in education integrating ICTs requires not only the infrastructure development and their availability, pedagogical training to the teachers for their productive use is equally important.

Abbreviations

ASEAN	Association of South East Asian Nations
CALL	Computer Assisted Language Learning
CD	Compact Disk
CDC	Curriculum Development Center
DC	Data Collector
Ed	Editor
EDD	Education Development Directorate
ELTAL	English Language Teaching and Learning
ERO	Education Review Office
FRP	Formative Research Project
ICT	Information and Communication Technology
ICTEMP	Information and Communication Technology in Education Master Plan
ICTs	Information and Communication Technologies
LMS	Learning Management System
MOE	Ministry of Education
N	Number
NWNP	Nepal Wireless Network Plan
OLPC	One Laptop Per Child
P	Page
PP	Pages
QAAHE	Quality Assurance Agency for Higher Education
RCHED	Research Center for Higher Education Development

SEAMOE	South East Asian Ministers of Education Organization
SSDP	School Sector Development Plan
SSRP	School Sector Reform Plan
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TYP	Three Year Plan
UNESCO	United Nations Educational Scientific and Cultural Organization
UTAUT	Unified Theory of Acceptance and Use of Technology

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SECTION I: INTRODUCTION

1.1 Background

The concepts such as quality enhancement and quality assurance have been some of the common concerns in the field of education at present. Quality enhancement is one of the aspects of institutional quality management process that is designed to secure reliable and demonstrable improvements in the quality of learning environment (QAAHE, 2006). It is one of the main objectives of quality assurance which refers to keeping the track of quality or standards in the educational systems in educational institutions (Allais, 2009). Quality assurance in education is ensuring a learning environment in which the content of programmes, learning opportunities and facilities are fit for purpose. UNESCO (2004) defines quality assurance as a systematic review of educational programs to ensure that acceptable standards of education, scholarship and infrastructure are being maintained (as cited in Kahsay, 2012). Quality enhancement, quality management, quality assessment, and quality control, are some of the means through which quality of an educational programme can be ensured. As quality enhancement is at the heart of quality assurance activity, these two are inter-related.

'Quality' and 'enhancement' should be defined in educational context to understand and develop clear concept of quality enhancement in education. According to Harvey and Green (1993), 'quality' in education can be conceptualized in five ways as: (i) perfection (a consistent or flawless outcome with zero errors), (ii) excellence (achieving the highest of standards), (iii) transformation (continuous improvement), (iv) fit for purpose (satisfying needs), and (v) value for money (cost effectiveness). Likewise, 'enhancement' can be understood as the activity of educational improvement through learning from identified strengths and weaknesses, and sharing and dissemination of good practices within or among institutions. Thus, quality enhancement may be conceptualized as the educational improvement in the activities of an institution so as to achieve the higher degree of standard.

Quality in education is one of the most important requisites for easy survival at present day's global competition. Allais (2009) discusses some of the traditional ways of monitoring and improving quality in education such as external examination, systematic evaluation, and inspection. According to Ali & Madhekar (2017), there can be four key steps for enhancing quality in education as (i) Participatory Teaching-Learning System , (ii) Self-Assessment , (iii)

Guided Principles of Teaching Learning process such as quality Staff, appropriate teaching learning methods, integration of information technology, focus on critical thinking and originality, and skill development mechanism, and (iv) Use of Lesson Plan. Likewise, Matei and Iwinska (2016) present the five principles of the national quality enhancement framework in Scotland as responsibility, ownership, commitment to enhancement, student involvement, and public information. Daniel and Franklin (2014) discuss that a balanced curriculum is one of the pre-requisites for the enhancement of quality in education. They argue that innovative learning approach and innovations in learning are essential to make education learner-centric. They propose the necessity of an innovative learning approach in a tailor-made curriculum which includes problem-based learning, social learning, and collaborative learning; and both formative and summative assessment.

Enhancing quality of education by providing the citizens with appropriate knowledge and skills to enable them work actively so as to integrate Nepal into the global community is the long-term goal of education in Nepal. Use of Information and Communication Technologies (ICTs) in education has been considered as one of the strategies to achieve this broader goals of education (MOE, 2013).The Ministry of Education in Nepal aims at providing necessary skills on ICT to the students as well as using ICTs as an important tool to improve classroom delivery, increase access to learning materials and improve effectiveness and efficiency of overall educational governance and management. The advancement in the integration of ICTs in education system through different activities such as developing ICT infrastructures, producing e-learning materials and resources, and providing training to the teachers; has been one of the main targets in different plans and projects such as One Laptop Per Child (OLPC)-2008 , Formative Research Project (FRP)-2009, Three Year Plan (TYP) 2011-2013, Nepal Wireless Network Project (NWNP)-2009, and School Sector Development Plan (SSDP) 2016-2022. In the School Sector Reform Plan (SSRP) 2009-2015, ICT in education has been identified as an innovative and effective means of teaching and learning, and the plan has aimed at implementing and expanding ICT assisted teaching/learning process in all schools (MOE, 2013).

In 2013, Government of Nepal, Ministry of Education prepared an ICT in Education Master Plan (ICTEMP) 2013-2017 as a guideline for the implementation of ICT in school education in Nepal to ensure extensive use of ICT in education sector and contribute for access

to and quality of education for all. There were four components in the ICT in education Master Plan: Development of infrastructure including connectivity, development of human resources, development of digital learning materials, and enhancement of education system. The Master Plan covered five major sub-sectors of education. They were: School Education, Higher Education, Teacher Education and Training, and Continue Education and Life-long Learning. The main goals of ICT in Education Master Plan were:

- to expand equitable access to education;
- to enhance the quality of education;
- to reduce the digital divide;
- to improve the service delivery system in education

In the school education curricula in Nepal, the English language (and teaching and learning of English) is one of the core components of (CDC, 2007). Teaching and learning of English has been given a considerable priority by the government of Nepal because of the fact that English is not only an international lingua-franca, it is the storehouse of knowledge in which many of the world's books, journals and newspapers are published; it is the language most often used in the websites and internet; and it is the language in which most of the innovations in science and technology are introduced (Harmer, 2007). Therefore, the English language is being taught and learnt as a compulsory subject in all the classes in the school level education; and in the bachelor level in the higher education in Nepal. However, there are many problems and challenges in teaching and learning of English in the Nepalese schools (Shrestha, 2008, Bhattarai, 2006). Poor infrastructure development, the learners' economic and socio-linguistic background, use of traditional methods, no use of teaching materials and technological tools, lack of adequate pedagogical training to the teachers are some of the main problems that affect the quality of English language teaching and learning (ELTAL) in Nepal. Because of all such affecting factors, the quality of the students' English language proficiency is below the average level (ERO, 2015, Sijali, 2016).

Regarding the ways of making improvement in the quality of teaching and learning of English, research studies have claimed that incorporation of ICTs can create opportunities for collaborative learning; and make learning meaningful by helping achieve cognitive gain, motivational gain, and interactional gain (Davies, 2007; Richards, 2007). The ICT tools such as language learning software, language learning platforms, and several technology-enhanced

methodological innovations like computer assisted language learning (CALL) can make English language learning easier and more effective (Dina & Ciornai, 2013). ICTs can increase access to information and resources, and they enhance interactive and collaborative learning (CDC, 2007). Recently, the government of Nepal has realized that integration of ICTs in the school education system is one of the appropriate strategies to create student centered, interactive and collaborative learning environment for ensuring the betterment in the quality of education (MOE, 2013).

On the whole, quality enhancement in education is making improvement in the existing educational system to achieve the standards or excellence. There are different ways of enhancing quality in education. Several research studies have concluded that the use of ICTs in education is essential because they can provide unprecedented opportunities for the teachers and learners to have access to a variety of resources and information to enhance quality in education (Jimoyiannis, 2012; Kumar & Tammelin, 2008; Angello, 2017; Adams & Brindley, 2007). Likewise, many of the research works have claimed that English language teaching and learning can take several advantages of using ICTs such as providing huge amount of exposure, creating interactive and collaborative learning environment, and providing opportunities of exploring and investigating, and so on (Acevedo, 2016; Rank,Warren & Millum, 2011). Therefore, many initiatives and investments have been undertaken to integrate ICTs into education (Becker & Reil, 2000). In Nepal, the integration of ICTs in the education system has been considered as one of the appropriate strategies by the Government of Nepal at present (MOE, 2013). Several different plans and projects (mentioned above) have made policies to develop ICT infrastructures, produce e-learning materials and resources, and train the teachers about pedagogical use of ICTs have been targeted for effective integration of ICTs in the school classrooms with the aims of bringing improvement in the quality of teaching and learning of different subjects including English. Analytical evaluation of such plans and policies has been some of the concerning issues in Nepal at present.

1.2 Statement of the Problem

With regard to the background discussed above, it can be understood that integration of ICTs has been considered as one of the strategies for enhancing the quality in education in Nepal. MOE has realized that ICTs have several potentialities to support the teachers and the students in their teaching and learning activities. For systematic and organized integration of

ICTs in educational institutions, ICTEMP was started in 2013, which considered the development of ICT infrastructures in the schools as one of the important components. The implementation of the ICTEMP has been completed by 2017, and it has been a good time to study and analysis of its achievements and outcomes. Therefore, the study of the development of ICT infrastructures in the schools, and their use in the classroom have been some of the important and relevant issues at present to understand and review the achievements of ICTEMP and to make further strategic plans. However, an objective study of the current status of the ICT infrastructures development in the schools and their integration into the English language classroom activities so as to overview the ICTEMP is still lacking. The need of the study of the status of ICT infrastructure development in the schools as a part of ICT integration for quality enhancement in education; and the need of reviewing the achievements of ICTEMP have been identified as the problems to be addressed in this study.

1.3 Objectives of the Study

The analysis of the achievements and outcomes of the implementation of ICTEMP 2013-2017 regarding the development of ICT infrastructures in the community schools in Nepal as a component of ICT integration for enhancing the quality in education is the general objective of this study. The study has aimed at studying the status of basic ICT infrastructures development in the community schools and their integration into the English classrooms. The specific objectives of the study were:

(a) to describe the current status of the basic ICT infrastructures development in the community schools in Nepal,

(b) to explore the ICTs the English language teachers use in the English classroom, and

(c) to review the achievements of ICTEMP with regard to ICT infrastructures development and their use.

1.4 Research Questions

As an attempt to attain the objectives, following queries had been raised as the research questions in this study:

(a) What is the status of basic ICT infrastructures development in the community schools in Nepal?

(b) What ICT tools do the English language teachers make use in their English classroom?

(c) What is the extent of the achievements of ICTEMP with regard to the development of ICT infrastructures and their use by the teachers in the schools?

1.5 Rationale of the Study

This study is concerned with the evaluation of the extent of success or failure of the ICTEMP 2013-2017 implemented by the Government of Nepal Ministry of Education (MOE) with regard to the development of ICT infrastructures in the community schools in Nepal. ICTEMP was implemented in Nepal with an aim to the integration of ICTs as a strategy for quality enhancement in education, which included the development of the basic ICT infrastructures in the community schools as one of its main components. This study has made an attempt to examine and analyze the status of the basic ICT infrastructure development in the community schools after completion of the implementation of ICTEMP. Thus, as evaluation or making an overview of any educational programme is one of the very essential components for determining its strengths or weaknesses, this study is significant in the sense that it gives constructive feedback about the programmes to the program/plan organizer and to all other stakeholders. The findings of the study of the current status of ICT infrastructures development and their integration into the school classrooms provides some lessons to continue or to review and revise the strategies in future; and to design further plans or programmes. Moreover, the study is expected to be a valuable work to provide practical insights for the project or policy designers, and to all those who are interested and/or are concerned with integration of ICTs in into the school classroom, and enhancement of quality of education.

1.6 Delimitations of the Study

This study adopted quantitative research design and survey-based questionnaire as the research tool and made use of only quantitative data. It was possible to use many other qualitative data using the tools such as interviews and observation to make the study more comprehensive and complete, quantitative data were used to find results and analyze them in more scientific way, and to save time and effort. Likewise, only Morang district was taken as the field of research to study the status of the development of ICT infrastructures in the community schools. Similarly, only 60 community schools from Morang district were taken as the sample schools in the survey study, and only 60 English language teachers form those sample schools were the participants in the study.

1.7 Organization of the Study

In addition to the preliminary parts and the references and appendices, the main body of this study has been organized into five sections: (i)Introduction, (ii) Review of Literature and Conceptual Framework, (iii) Methodology, (iv) Findings, and discussion, and (v) Conclusion and implications. The first section 'introduction' mainly includes the background of the study, statement of problem, rationale of the study, objectives of the study, research questions, and delimitations. Likewise, the second section consists of the review of related literature, implication of the literature review, theoretical framework, and conceptual framework of the study. In the same way, the third section deals with research design, tools and methods of data collection and data analysis, validity and reliability, and ethical considerations. The fourth chapter consists of findings of the results and their analytical discussion, and the fifth section deals with the conclusions drawn and the implications of the study.

SECTION II: REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

2.1 Review of Related Literature

Quality enhancement and quality assurance in education have become some of the common mottos of the educational institutions in recent years. Quoting 'European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)' Hopbach (2014, p. 224), writes , "Quality assurance and quality enhancement are inter-related and describe a cycle that allows a higher education institution to assure itself of the quality of its activities and to take opportunities for continuous improvement". He discusses three main purposes of quality assurance that it can function as: (a) a transparency tool by providing the public with independent information about the quality and performance of institution for comparative purposes, (b) a policy evaluation tool by playing a main role as a steering mechanism for education system, and (c) a developmental tool by helping the institution reach their full potential. He stresses that quality assurance is killing too many birds with a stone as it functions many purposes such as informing performance-based funding schemes, evaluating certain policies if they were successful, or providing information for making a comparison of the institutions.

Different research works have found ICTs to be useful for quality enhancement in education. Fallows and Bhanot (2005, p. 1) perceive ICTs as a basic toolkit without which various duties of teaching and learning are impossible. They define quality as 'fitness for purpose' and view that teaching must be fit for the purpose, and that requires appropriate use of ICTs (pp.2-3). They opine that appropriate use of ICTs can enhance the quality of the learning experiences of the students. They also warn that if technologies are not used with due care and attention, they can equally result negative outcomes. Jonassen, D., Peck, K.L., Wilson, B.G. and Pfeiffer, W.S. (1998) pointed out five important roles of technology that they (i) provide access to necessary information, (ii) provide real world context, (iii) act as a tool for collaboration between or among the students, (iv) can represent learners' ideas, and (v) serve as intellectual partners to provide reflection on the tasks. All these functions of technology help promote quality of teaching and learning.

The implementation of ICT-integrated teaching and learning necessitates good ICT knowledge and skills. According to Wang (2014, p. 188), though technological advancement has created opportunities to enhance the quality of teaching and learning effective and efficient use of ICTs and ICT programme can be problematic and frustrating to the teachers due lack of necessary skills. O'Mahony (2003) opines that proficient use of ICTs is still a challenge because of the reasons such as insufficient and inefficient professional development of the teachers, insufficient access to Ict facilities, unfavorable ICT policies, lack of technological support, negative attitudes towards ICT use, lack of teachers' and students' ICT knowledge and skills. Poor ICT pedagogy is one of the key factors that influences the productive use of technology which consequently affects the quality enhancement in education. Therefore, teachers are required to be equipped with pedagogical skills for effective exploitation of emerging technologies (Kim & Baylor, 2008).

The use of computer technology in teaching and learning can be traced back to the early 1970s (Levy, 1997). According to Hu and McGrath (2011), the educational institutions in many countries became interested towards the potential contribution of ICTs and computer mediated communications, because of the features of ICTs like flexibility and versatility. Romeo and Walker (2002) describe the influence of the use of ICTs both in behaviorists' theory as a mechanism to deliver information and in constructivism as a system to enhance teaching and learning. In this way, constructivist learning environment focuses on the exploitation of technologies.

Some research investigation based on the Nepalese educational context have been carried out to study different ICT-related issues. Newa (2007) conducted a research study based on the Nepalese school education context, that aimed at finding out the teachers' satisfaction and the attitudes towards ICTs, who were working at the community and institutional schools. The study found that the teachers working at the community schools were relatively more satisfied than the teachers in institutional schools. However, the teachers working at the institutional schools used ICTs more frequently that the teachers at the community schools though the teachers at both types of the schools had positive attitudes towards ICTs. Likewise, Pouezevara and Parajuli (2007) examined the effectiveness of ICT tools for better learning outcomes. They found that the video recording methods improved the reputation of teacher training programme, and it increased participation of the teachers. In the

same way, Acharya (2013) examined commonly used ICT tools in ELT in the secondary and higher secondary schools in Kathmandu valley. It was found in the study that the tools such as mobile phones, laptop, multi-media projectors, You Tube, Facebook, Wiki, and E-mail were the most commonly used in English language teaching. Likewise, Thapaliya (2014) investigated the English language teachers' perception and the challenges of ICT integration in teaching English. He found that the teachers were positive towards ICT tools and the tools such as audio tapes, mobile phones, radio, video tapes, and emails were used by the teachers. the study found that insufficient ICT infrastructures, inadequate class time, inadequate training opportunities to the teachers, were some of the major problems of the teachers.

The integration of ICTs in teaching and learning process has been one of the common concerns of many of the researchers. Schrum and Levin (2013) conducted a multiple case study about integration of technology for the professional development of the teachers. They concluded that the teachers need to possess expertise of technological pedagogical knowledge for their professional development. Likewise, Jena (2015) carried out a research and analyzed technostress creator, and technostress effects to the teachers in India and found technostress, 'a modern disease of adaptation', a great problem while the traditionally habituated teachers need to teach the digital native students. Khechine and Lakhal (2018) carried out a study to understand the use of technology by the students in the educational context in term of the determinants such as age, gender, experiences, and social influences. They found that technologies did not lead to the outcomes expected, and the students were less satisfied with the technologies. The study concluded that technology played role as double-edge sword, and a careful use of ICTs is must needed.

It is important to note that effectiveness of ICTs and success or failure of ICT integration depends on where and how they have been applied and integrated. There can be several barriers for the successful integration of ICTs into the educational system. Findings have indicated that some of the important barriers in the ICT integration are lack and limitation of ICT infrastructures, lack of administrative support and lack of ICT-related training (Hutchison and Reinking, 2011; Hu and McGrath 2011; Wang, 2014). According to Ertmer (1999), the barriers in ICT integration can be of two types: extrinsic and intrinsic. The extrinsic barriers are the first order barriers that include lack of ICT infrastructures such as problem in access to ICT resources and lack of ICT support and training. On the other hand, intrinsic

barriers include the barriers caused by the attitude and belief of the stakeholders towards ICTs. According to Alwani (2008), external barriers are related to organization rather than individual, while intrinsic barriers are related to individuals such as teachers and administrators.

The South East Asian Ministers of Education Organization Regional Centre for Higher Education and Development (SEAMEO RIHED) pointed out some of the obstacles and challenges related to the implementation and effective management of quality assurance systems in Association of South East Asian Nations (ASEAN). The most common problems listed in SEAMEO RIHED were (2012, p.5):

- Lack of resources to support quality assurance initiatives including insufficient funding
- Lack of quality experts (for example to conduct external reviews)
- Limited tools and knowledge and lack of awareness of quality assurance implementation
- Restrictions at a policy level as quality assurance development strategies are rare
- Quality assurance responsibilities sometimes falling within several government departments.
- Lack of leadership for respective countries to strengthen their national quality systems.

The review of related literature gave an insight that development of ICT infrastructure is one of the pre-requisites for educational institutions to reach their full potential by creating opportunities to enhance the quality of education. ICTs have important place in both behaviorist and constructivist approaches of teaching and learning. However, it is true that ICTs themselves do not lead to the expected outcomes, they are like double-edge swords and their usefulness largely depends on how they have been used. There can be several barriers both intrinsic and extrinsic, that affect the effective management of quality enhancement in education integrating ICTs.

2.2 Implication of Literature Review and Research Gap

Several research studies related to the enhancement of quality of education and integration of ICTs in education have been carried out such as Allais, 2009; Harvey and Green 1993; Jimoyiannis, 2012; Kumar & Tammelin, 2008; Angello, 2017; Adams & Brindley, 2007 Shakya, (2007), Newa (2007) and so on. The review of these research works has helped conceptualize the knowledge and ideas, and strengthened insights about the phenomenon.

Likewise, the review has provided insightful knowledge to formulate theoretical and conceptual framework for the study. However, it has been found that most of the research works have been carried out in the foreign country context, outside Nepal. Such studies are not adequate enough to address and operate the issues based on the realities of Nepalese educational context. Moreover, the research works related to quality enhancement and integration of ICT in education carried out in Nepalese educational context are quite a few. In addition to this, the few research works carried out in Nepalese context are related to the teachers' and students' perception towards ICTs, they have paid little or no attention to study the status of ICT infrastructure development which is the main aim of this study.

2.3 Theoretical Framework

The theoretical framework that will guide this study to explore the integration of ICTs in the educational system is the Unified Theory of Acceptance and Use of Technology (UTAUT). This is a framework of the use and adoption of technology, which was proposed by V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis in 2003. The model was developed by reviewing many previous models that explain technology usage like TAM (Technology acceptance model), TPB (Theory of planned behavior), and TRA (Theory of reasoned action) (Venkatesh, Morris, Davis, & Davis, 2003). This framework considers four main factors that affect the use and adoption or integration of technology: (i) performance expectancy, (ii) effort expectancy, (iii) social influence, and (iv) facilitating conditions (Venkatesh et al, 2003). According to this framework, these four factors are independent variables that influence the adoption and integration technology (ICTs), which is the dependent variable.

In this framework, performance expectancy is one of the factors which refers to the user's belief that the technology will help him/her in the performance of job. Likewise, effort expectancy is the degree of effort that the user requires to use the technology. In the same way, the factor social influence is the perception of the user towards technology regarding the social status of the tool. The factor 'facilitation conditions' refers to the availability of the infrastructures needed to use the technology. This last factor is much more relevant to guide the study of the status of ICT infrastructure development.

2.4 Conceptual Framework

The study of ICTs in the school education is the main concern of this study. As ICTs have been considered to be useful tools for quality enhancement by MOE, this study attempts at exploring the achievement of ICTEMP regarding some of its components: the development of ICT infrastructures and their integration in the school classroom. ICTEMP, the intervention, is the independent variable, and ICT infrastructure development and integration of ICTs in the classroom are the dependent variables in this study. To understand the achievement of ICTEMP, the status of ICT infrastructures in the schools, and their use in the classroom activities have been studied in quantitative design using questionnaire survey as the research tools. Use of random methods for the selection of the sample, numerical data collection from the school teachers, use of descriptive and inferential statistics for data analysis, and interpretation of the findings for drawing conclusion are some of the main concepts of this study. The conceptual framework of this study has been presented in Figure 1.

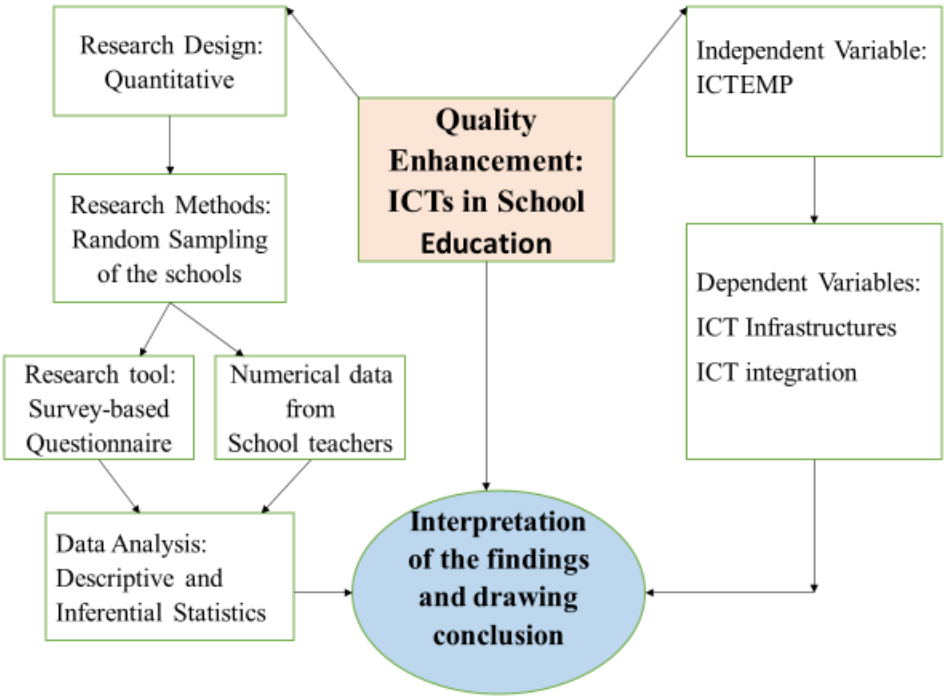


Figure 1: The Conceptual Framework

SECTION III: METHODOLOGY

3.1 Research Design

The quantitative research design was adopted in this study to explore the achievements of ICTEMP including the status of the development of ICT infrastructures, and the use of ICTs by the English language teachers in their classrooms. Though it is often nose-wrinkling to use quantitative design in some educational research, it is due to lack of experience and knowledge with this approach (Roni, Merga, & Morris, 2020). In fact, qualitative methods are prevalent in some sub-fields such as educational psychology, and many of the researchers in educational and social sciences are increasingly moving towards accepting both quantitative and qualitative approach as important, valuable and complement to each other (p. 2). Quantitative designs are used to construct or test theories, or to measure and explore the effect or influence of a range of independent variable on dependent variables (p. 11). One of the advantages of a quantitative design is that it enables the researchers to measure the reactions of a great many people to a limited set of questions, and it facilitates comparison and statistical aggregation of the data (Patton, 2002, p. 14). Likewise, this research design is that it allows to use statistical data which helps to save time, resources, and effort that the researchers need to describe the result (Daniel, 2016; Bryman, 2001). Moreover, quantitative research is more scientific and objective for generalization by collecting and analyzing numerical data (Creswell, 2009, Cohen, Manion, & Morrison, 2018). A descriptive quantitative design enables the researcher to describe a particular situation to find the trends within the research context (Roni, Merga, & Morris, 2020, p.19). This design was used in this study that helped the researcher to describe the status of ICT infrastructure and use of the ICT tools by the teachers in their classrooms.

3.2 Field of study

Morang district of province number one was chosen as the field of study in this research investigation. Morang is one of districts among others in this province with high density of population. There are 537 community schools including 158 secondary and 379 basic schools, and 398 institutional schools including 190 secondary and 208 basic schools in Morang district (E D D, 2019). Therefore, it is a district where several educational activities, and educational trends and facts related to teachers and their teaching methods, infrastructure and other physical facilities, instructional materials and the technologies used can be studied.

The information of all types of schools that range from advanced schools located at urban areas to schools in remote rural areas with very poor infrastructures can be obtained in this district. Likewise, information related to the experiences and practices of the teachers that range from highly qualified and experienced teachers to newly appointed teachers with basic qualification can be studied in the district.

3.3 Participants

Altogether 60 community schools (25 Secondary schools, and 35 Basic schools) from Morang district were selected as the sample schools using stratified random sampling method so as to include the schools from all the 17 local levels of the district (see appendix B). Out of those 60 schools, 36 community schools were selected randomly in such a way that four schools were included from each nine local levels located in comparatively urban area, and 24 community schools were randomly selected in such a way that it could include three schools from each eight local levels located in relatively rural area of the district . The community schools excluding the institutional schools were taken as the sample because the government is directly responsible to manage all the physical and human resources in these schools, where the plans and policies of the government such as ICTEPM were implemented. Likewise, the random sampling methods were most useful for establishing objectivity in the study, and for making generalization in the population (Creswell, 2012). In the same way, altogether 60 English language teachers from those schools were requested to perform the role of participants. The English language teachers were chosen because English language is mostly used in the fields of Internet and ICTs, and English language teachers generally feel more comfortable to use and be familiar with ICTs, and they are relatively more capable to provide information related to ICTs than other subject teachers.

3.4 Research tool, Data Collection and Data Analysis

A survey-based questionnaire, which is the most common in quantitative design, was used as the research tool in this study (see appendix A). Surveys are the most common qualitative data collection tools for the researchers and these are commonly used in educational and psychological research (Cohen, Manion, & Morrison, 2018; Mertens, 2010). Much care was taken to construct the questionnaire so that it will help to obtain the data required. In the questionnaire, there were three multiple choice questions, three five-point Likert type questions, and one check list item questions. The questionnaire included the questions related

to access to and availability of both hardware and software ICTs in the schools such as computer/s, laptop/s, computer lab, e-library, computer teacher, projector, smartboard, Internet, and e-learning resources such as videos, or other special software resources, and their use in the classroom by the teachers.

For the collection of data four students doing their bachelor degree were appointed as the Data Collector (DC) and they were adequately oriented about the questions of the questionnaire and other necessary considerations needed to be taken into their mind. Each of the DCs were asked to visit 15 schools and contact the headmaster and the English language teachers who had agreed to co-operate the data collection in the telephone conversation with the researcher beforehand. The CDs facilitated the teachers to solve the questionnaire giving clear instructions in their confusions. The DCs took five days to complete the collection of data and they submitted the questionnaires solved by the teachers to the researcher. The data collected were studied, presented in tables and charts; and were analyzed using descriptive and inferential statistics. The results were interpreted based on the facts obtained and comparing them with the past literature.

3.5 Validity and Reliability

Validity in research refers to the state of being it soundful in its design and methods used. Cohen, Manion, and Morrison (2018) view that validity of a research is demonstration that the instrument used measured what it intended or what it claimed to measure. Likewise, reliability refers to the degree of consistency of the methods and procedures. As in quantitative research design the researcher is concentrated to determine the relationship among the variables using numerical data, following the same line, this research explores the achievements and effects of ICTEMP, the independent variable; on the development of ICT infrastructures and their integration, the dependent variables. Likewise, using the random sampling methods in the selection of sample size, this research ensures bias-lessness and generalizability of the findings. Similarly, developing a set of questionnaires and distributing the same to all participants, the research maintains consistency of procedures, and that using objective type of close-ended questions, the research establishes objectivity and avoids subjective interpretation by means of the statistical treatments in the study. Moreover, the teachers as the participations in this study are the right informants with practical experiences,

who can provide accurate data about the ICT infrastructures development in the school and their integration into the classrooms.

3.6 Ethical Consideration

Research ethics refers to the conduct of the investigator based on professional codes and values such as authorship and attribution of credit, taking permission from the institution and consent from the participants, respecting the participants' confidential, and so on. In this research work, I took permission from the school headmasters to collect data, and consents were taken from the participant teachers to collect their experiences related to the topic. I was much careful not to shake the data and information collected in their analysis and interpretation. I carefully gave credit for ownership of the resources–books, articles, magazines etc. all the participants were treated equally. I was careful not to harm them and not to disclose their confidentiality.

SECTION IV: FINDINGS AND DISCUSSION

4.1 Findings and discussions

Integrating the country into global community by ensuring the quality of education to all students is the long-term goal of education determined by the Ministry of Education (MOE) in Nepal. MOE has considered ICT as an important tool for providing the students with useful learning materials and effective classroom delivery. As a consequence, MOE had prepared ICTEMP 2013-2017, and had implemented it in the country with ICT infrastructure development including internet connectivity in the all schools as one of its core components. This section includes the findings of this study, and discussion regarding ICT infrastructure development and their use in the classrooms by the teachers. the results have been presented in the Tables and graphs, and they have been interpreted in the paragraphs to come under following sub-headings.

4.2 Availability of ICT infrastructures in the schools

The development of the infrastructure is the first basic requisite for the integration of ICTs in to the classroom. ICT infrastructure development in the schools was one of the important priorities in the ICTEMP 2013-2017. The findings of this study related to the status of ICT infrastructures in the schools has been presented in Table 1.

The data reveal that electricity that is the most basic infrastructure was available in 56 (93.3%) of the sampled 60 schools, only 4 (6.7%) schools were out of reach of electric power facility. 38 (63.3%) schools were able to manage desktops for official and teaching and learning purposes while CDs were available in 36 (60%) of the schools. Likewise, in altogether 31 (51.7%) schools, there was availability of photocopy machine and printing facilities, and scanning was made available in 17 (28.3%) schools. One of the most requisites for ICT related activity 'Internet' was made available in 28(46.7%) schools. Those schools had also managed ICT labs for the teachers and students. The multimedia projectors were available in altogether 10 (16.7%) schools while e-library and solar power were managed in respectively 9 (15%) and 8(13.3%) schools. In the same way, in 6 (10%) schools there were web cameras, while interactive whiteboard and LMS were managed in 5(8.3%) schools. Mobile phones were possessed by and available to all the teachers.

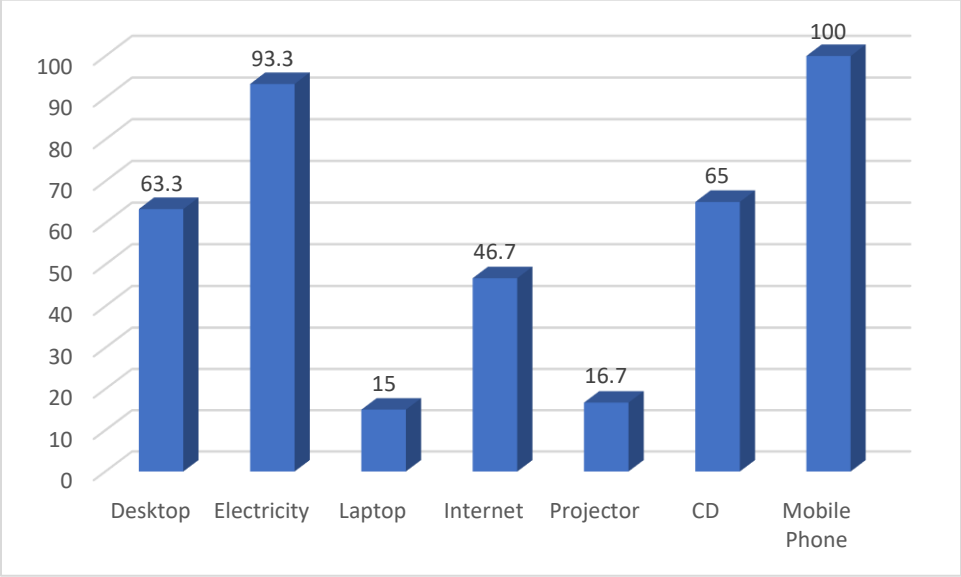
Table 1: Availability of ICT infrastructures in the schools

S N	ICTs	Available		No Available	
		No of schools	Percentage	No of schools	Percentage
01	Desktop	38	63.3	22	36.7
02	Laptop	9	15	51	85
03	Electricity	56	93.3	4	6.7
04	Solar power	8	13.3	52	86.7
05	CD	39	65	21	35
06	Internet	28	46.7	32	53.3
07	Multimedia projector	10	16.7	50	83.3
08	Interactive whiteboard	5	8.3	55	91.7
09	e-library	9	15	51	85
10	Photocopy machine	31	51.7	29	48.3
11	ICT-lab	28	46.7	32	53.3
12	Web camera	6	10	54	90
13	LMS	5	8.3	55	91.7
14	Mobile phone (personal)	60	100	0	0
15	Printer	31	51.7	29	48.3
16	Scanner	17	28.3	43	71.7

N=60

Some more information was collected about ICT lab. Among the schools which had ICT lab, only in 12 schools there were computer teachers and the class teachers were given responsibility to work as the ICT lab teacher in 14 schools. In 2 schools, the headmasters were responsible to run ICT lab. The data revealed that the size of ICT lab was rather small with no more than 5 computers in 8 schools where only 5 to 10 students could sit and learn at a time. Likewise, in 16 schools, there were 6 to 10 computers for 11 to 15 students to sit and learn. In 4 schools, there were 11 to 15 computers where more than 15 students could learn at a time. One of the most pervasive and portable ICT devices, the mobile phones, which can function as mini-computer, were available to all the teachers in all schools. Electricity is the most basic

requisite for promotion of technological education, which in this study is available to most of the schools. Likewise, the computer (desktop) which is another essential tool, has been managed in 63.3% of the schools. However, the internet, which is the heart of ICT integrated education for creating e-learning environment and increasing amount of exposure to English language, found to be made available in only 46.7% of the schools. This indicates that regarding the achievement of connectivity of the internet to all schools, which was one of the main components of ICTEMP is below the average level. It also indicates that many of the schools (about 17%) are compelled to use the computers in the offline mode, they are unable to make optimum use of their computers for finding e-learning resources. Likewise, the data shows that only about one fifth of the schools seem to make effective delivery of the contents due to the lack of the tools such as projector and laptop. This has been presented clearly in Figure 1. Moreover, the ICTs such as interactive whiteboard and LMS were available only in a few schools (below 10% of the schools), many of the schools are out of the reach of such effective e-learning modern tools.



N=60

Figure 1: Availability of most essential ICTs (in percentage)

4.3 ICTs used by the teachers in the classroom

The data were collected to understand the ICTs used by the teachers in their classroom. For this, a Likert type question was developed in the questionnaire, in which a list of possible ICTs were given and the participants were asked to indicate the frequency of the use of the

tools with a tick mark among the alternatives 'always, usually, often, sometimes, and never'. The results of the data have been presented in Table 2.

Table 2: ICTs used by the teachers

SN	**ICTs**	**Always** (more than 75% of your working days)		**Usually** (51% to 75% of your working days)		**Often** (26% to 50% of your working days)		**Sometimes** (up to 25% of your working days)		**Never**	
		No	%	No	%	No	%	No	%	No	%
01	Desktop			14	23.3	15	25	5	8.3	26	43.3
02	Laptop					4	6.7	4	6.7	52	86.7
03	CD			3	5	21	35	9	15	27	45
04	Photocopy machine					4	6.7	8	13.3	48	80
05	Interactive whiteboard					2	3.3	3	5	55	91.7
06	Multimedia projector			2	3.3	2	3.3	4	6.7	52	86.7
07	Internet	3	5	8	13.3	8	13.3	3	5	38	63.3
08	e-library			2	3.3	6	10			52	86.7
09	ICT-lab			6	10	8	13.3	6	10	40	66.7
10	LMS					2	3.3	2	3.3	56	93.3
11	Tablet							4	6.7	56	93.3
12	Mobile phone (personal)	8	13.3	20	33.3	10	16.7	13	21.7	9	15
13	Printer			5	8.3	9	15	10	16.7	36	60
14	Scanner							12	20	48	80

N=60

The data reveal that ICTs such as mobile phones were used by most of the teachers. Altogether 51 teachers used mobile phones in teaching English. Among the teachers, these tools were used always by 8 (11.3%) teachers, usually by 20 (33.3%) teachers, often by 10

(16.7%) teachers, and sometimes by 13 (23.3%) teachers. Likewise, desktops were used for teaching English by 34 (56.7%) teachers; it was used usually by 14 (23.3%) teachers, often by 15 (25%) teachers, and sometimes by 5(8.3%) teachers. Similarly, CDs were used by 33 (55%) teachers; usually by 3 (5%) teachers, often by 21 (35%), and sometimes by 9 (15%) teachers while printer was used by 24(40%) teachers; usually by 5 (8.3%), often by 9(15%) , and sometimes by 10 (16.7%) teachers. Another important tool Internet was used by 22 (36.7%) teachers, which was always used by 3 (5%), usually and often by 8 (13.3%), and sometimes by 3(5%) teachers. Likewise, 20 (33.3%) teachers used ICT lab; which was used usually by 6 (10%) teachers, often by 8 (13.3%), and sometimes by 6 (10%) teachers. In the same way, photocopy machine and scanner were used by 12 (20%) teachers; while projector, laptop, and e-library each were used by 8 (13.3%) teachers. The tool interactive whiteboard was used by 5 (8.3%) teachers, and Tablet and LMS each were used by 4 (6.7%) teachers.

The data reveal that there were significant differences between the tools/resources available and their practical application by the teachers in the classroom. Some of the teachers did not bring the available tools into use in their classroom teaching though they were available in the schools. It has been clearly presented in the Figure 2.

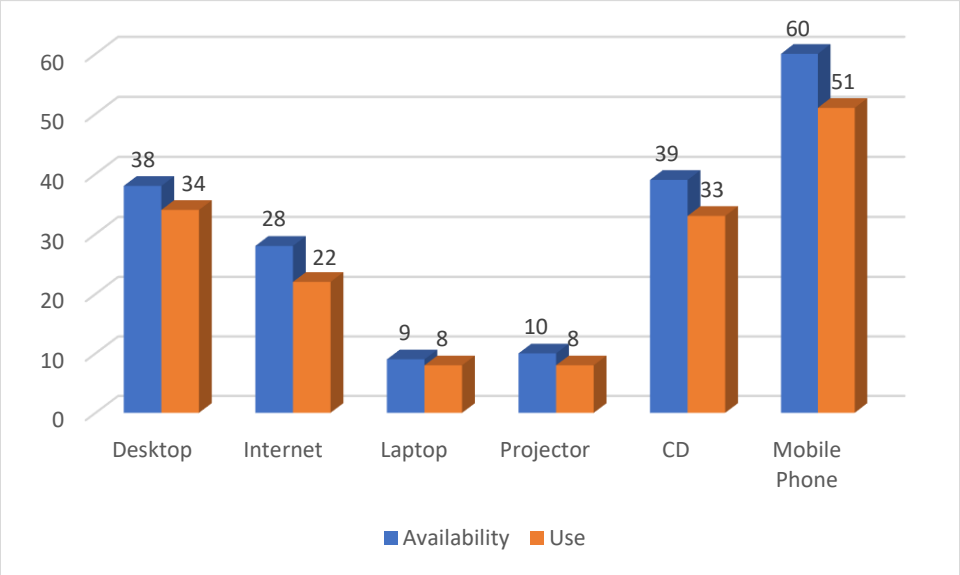


Figure 2: Availability and use of ICTs by the teachers

The data show that mobile phones were possessed by all the teachers. These tools, however, were used in teaching English only by 51 (85%) teachers. It reveals that altogether 9 (15%) of the teachers were not using the devices in spite of their availability. Likewise,

desktops were available in 38 schools, these, however, were used only by 34 teachers. the teachers in four schools do not utilize the devices. Internet, though was available in 28 schools, was used only by 22 teachers. 6 teachers (10%) do not bring it into use in teaching English. In the same way, CDs, which were available to 39 school teachers, were not utilized by 6 (10%) teachers. The tools projector and laptop that were made available in respectively 10 and 9 schools, were not utilized by respectively 2 and 1 teacher. There might have been several causes of this exclusion of the tools from bringing them into use. Some of the important causes might be that the teachers lacked technological and pedagogical knowledge of using the devices/tools, they ran shortage of time, they had difficult classroom environment such as size of the class, and attitude towards technology.

4.4 Mostly used ICT software tools by the teachers

Another aspect data collection was to understand about the use of ICT software tools by the teachers in teaching English. For studying this aspect, a Likert type question was developed, and the participants were requested to mark their frequency of their use of the software with a tick mark to indicate their frequency among the alternatives always, usually, often, sometimes, and never. the results of the data collection have been presented in Table 3.

The data reveal that 46 (76.7%) teachers used educational offline resources such as educational offline dictionary, English grammar, downloaded articles or books, and so on. Such resources were usually used by 24 (40%) teachers, often by 14 (23.3%) and sometimes by 8 (13.3%) teachers. Likewise, the tools YouTube and Websites each were used by 22 (36.7%) teachers. Between these tools, YouTube was used usually by 5 teachers, often by 5 teachers, and sometimes by 12 teachers, while Websites were usually used by 5 teachers, often by 7 teachers, and sometimes by 10 teachers. In the same way, Facebook and Messenger each were used by 19 (31.7%) teachers, usually by 3 teachers, often by 5 and sometimes by 11 teachers. Email was brought into use by 17 (28.3%) teachers, which was used often by 5 teachers and sometimes by 12 teachers. Similarly, chat and skype/video talk each were used by 12 (20%) teachers, often by 4 teachers, and sometimes by 8 teachers. In the same way, online educational programmes were often used by 3 teachers, and sometimes by 5 teachers, while e-library resources were often used by 3 teachers and sometimes by 4 teachers. Blogs and Wiki were sometimes used by 4 teachers and 2 teachers respectively.

Table 3**:** ICT software tools used by the teachers

S. N.	**ICT Tools**	**Always** (more than 75% of your working days)		**Usually** (51% to 75% of your working days)		**Often** (26% to 50% of your working days)		**Sometimes** (up to 25% of your working days)		**Never**	
		No	%	No	%	No	%	No	%	No	%
01	E-mail					5	8.3	12	20	43	71.7
02	Messenger			3	5	5		11	18.3	41	
03	Facebook			3	5	5		11	18.3	41	
04	YouTube			5	8.3	7	11.7	10	16.7	38	
05	Blogs							4	6.7	56	93.3
06	Skype/Viber/audio -video talk					4	6.7	8	13.3	48	80
07	Wiki							2	3.3	58	96.7
08	Chat					4	6.7	8	13.3	48	80
09	LMS							2	3.3	58	96.7
10	Websites/web browsers			5	8.3	5	8.3	12	20	38	63.3
11	Educational programs (online)					3	5	5	8.3	52	86.7
12	E-Library resources					3	5	4	6.7	53	88.3
13	Educational programs (offline)			24	40	14	23.3	8	13.3	14	23.3

4.5 Challenges in ICT integration

Yet another aspect of this study was to understand the challenges or difficulties the teachers encountered in integrating ICTs into the classroom. To study the teachers' experiences about the difficulties they faced, a Likert type question with a list of possible challenges was developed, and the participants were requested to mark their opinion in the options given: 'most

important, important, slightly important, and no important'. Table 4 presents a summary of the findings of the teachers' opinions.

Table 4: Challenges in ICT integration

S. N.	Difficulties/Challenges in ICT integration	Most important		Important		Slightly important		No important	
		No	%	No	%	No	%	No	%
01	Infrastructure	46	76.7	14	23.3				
02	Technological/ Pedagogical training	45	75	15	25				
03	Previous knowledge			12	20	88	20		
04	Economic Status of the learners			2	3.3	58	96.7		
05	Attitude of the stakeholders towards ICTs			30	50	30	50		
06	Administrative support			36	60	24	40		
07	Curriculum/Textbook			15	25	45	75		

The data reveal that poor infrastructure development, and lack of technological and pedagogical training were the most important problems or challenges in ICT integration to many of the teachers. Among the data collected, infrastructure development was the 'most important' problem to 46 (76.7%) teachers, and it was 'important' to 14 (23.3%) teachers. Likewise, lack of technological and pedagogical training was 'most important' challenge to 45 (75%), and important to 12(25%) teachers. In the same way, lack of administrative support was 'important problem' to 36 (60%) teachers, and it was 'slightly important' to 24 (40%) teachers. Similarly, attitudes of the stakeholders towards ICTs was 'important' challenge for 30 (50%), and it was slightly important to 30 (50%) of the teachers. in the same line, 15 (25%) teachers opined that the curriculum and textbooks were 'important', and causes to cause difficulties in integrating ICTs, while 45 (75%) teachers had their opinion that these were 'slightly important'. Similarly, 12 (20%) teachers gave their opinion that lack of previous knowledge was 'important' reason, while 48 (80%) teachers marked it as 'slightly important '

reason to cause difficulty in integrating ICTs into the classroom. The economic status of the students was 'important' to 2 teachers while it was 'slightly important' to 58 (96.7%) teachers. The data reveal that the reasons such as poor infrastructure, lack of technological/pedagogical knowledge, lack of administrative support, curriculum and textbooks, stakeholders' attitudes towards ICTs, are at least some important difficulties and challenges that hinder integration of ICT. The challenges infrastructure management and technological and pedagogical training were most important to majority of the teachers.

4.6 Discussion on the achievements of ICTEMP

ICTEMP 2013-2017 was prepared with the aim of ensuring quality of education in the school in Nepal. 'Development of Infrastructure including connectivity is one of the most important and fundamental requirements as the basic pillar to promote ICT in education (MOE, 2013, p. 13). The development of infrastructure which was one of the main components in ICTEMP mainly included ICT equipment, internet connectivity, multimedia classroom, virtual data center and educational resource sharing platform. The ICTEMP had planned to manage ICT laboratory for teachers as well as computers for teachers (p 14). The Master plan had made three strategies to expand the Internet to schools: (i) Coordination and collaboration between the government, Internet service providers and local communities; (ii) Collaboration with Nepal Telecom Authority for the expansion of internet connectivity to schools and other educational institutes; and (iii) Providing focused support to disadvantaged schools in remote areas (p 16). Two years after of the completion of the implementation of the plan, when this study was conducted, however, it was found that ICT lab and internet connectivity were available only in less than one third of the schools. This clearly shows that in majority of the schools the infrastructure development is yet to be managed. The challenge of infrastructure management was one of the most important problems to majority of the teachers. Majority of the schools are still unable to create even a basic e-learning environment to conduct ICT-based education. The teachers and the students in those schools are deprived of the opportunities of finding varieties of learning resources and delivering them in an efficient way. There are many challenges in the enhancement of educational quality integrating ICTs in Nepal such as poor or no availability of ICT infrastructures, lack of required ICT knowledge, negative attitudes of the stakeholders towards ICTs, lack of administrative support, and nature of exiting text-books and curriculum. As the study Fallows and Bhanot (2005) highlighted, the teachers need to be

equipped with at least basic ICT toolkits for ICT integrated instruction as one of the means to the enhancement of quality in education. Similar to the points discussed in SEAMEO RIHED (2012), integration of ICTs is problematic due to the lack of such requisites.

In the same way, the Master plan had aimed to develop human resources and prepare teachers for ICT based education by integrating ICT skills in in-service and pre-service teacher training curricula and in teacher preparation courses (MOE, 2013, p. 20). It was found however, that lack of ICT related pedagogical training was another most important challenging problem for integration of ICTs in education. A large percentage of the teachers (75%) expressed their opinion that they still are demanding pedagogical training and workshops for effective integration of ICTs in education. The data reveal that there are still some teachers who do not utilize the ICT tools that are available in their schools. It is also that their frequency of the use of such ICT tools in the classroom is sufficiently less than average level. As Schrum and Levin (2013) found, and Jena (2015) discussed, many of the teachers lack ICT skills and expertise, and technostress is a serious problem to the teachers. The teachers do not use even the available ICT tools in their teaching process. Of the several possible reasons of this 'no use of ICTs in spite of their availability' is inadequate ICT training to the teachers.

SECTION V: CONCUISION AND IMPLICATIONS

5.1 Conclusion

ICTs are considered to be useful for improving access to learning resources and for delivering the contents more effectively. Integration of such tools can benefit a lot for the improvement of the quality in education because they can create e-learning environment by providing learning-platforms and learning communities and increasing amount of exposure to English language learners. Development of ICT infrastructures and technological pedagogical training are the most important requisites for productive utilization of the tools in ICT-based instruction. ICTEMP 2013-2017, which aimed at developing ICT infrastructure, providing ICT-related services and courses, and providing e-learning materials, has contributed to some extent for ICT integrated instruction in Nepal. However, still majority of the schools are unable to run ICT-integrated education due to the lack of ICTs such as Internet, Laptop, projector, ICT lab, interactive whiteboard. More importantly, there are some teachers who do not use even the available ICTs.

5.2 Implications of the study

This research work studies the status of ICT infrastructures, and their integration into the school classrooms in Nepal. It mainly attempts at exploring the achievements of ICTEMP with regard to the infrastructure development in the community schools. This study has been expected to be a useful document to all the policy designers working in the field of ICTs and ICT integration on behalf of MOE in Nepal. Likewise, The results of the data collected from the school teachers as the participants in this study have reflected practical experiences of school environment, which can function as useful guidelines to the concerned authorities such as school supervisors, education officers, school resource persons, and other educators who have authentic responsibility to ensure educational quality in the schools. In addition, the government offices, NGOs or INGOs that run training and workshops to the school teachers can also be benefitted with the findings of the study in making further plans and programmes. Moreover, all the teachers and other stakeholders who are concerned with ICTs, and ICT integration for quality improvement in the school education can have some insights from the findings of this study.

5.3 Further Research

This research adopted purely quantitative approach to study the status of ICT infrastructure development and their use by the teachers in the school classroom. It aimed to evaluate the achievement of the ICTEMP 2013-2017 with regard to infrastructure development and their use in the school education in Nepal. However, it does not explore the reasons behind what was found in detail. A further research using qualitative techniques such as observation and interviews with the participants being an insider can be more valuable to explore the causes of what the plan achieved.

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APPENDICES

Appendix A: Questionnaire

1) Which of the following ICT infrastructures are available or not available in your school? Please tick (✓) in the appropriate box.

S N	ICTs	Available	No Available
01	Desktop		
02	Laptop		
03	Electricity		
04	Solar power		
05	Internet		
06	CD		
07	Multimedia projector		
08	Interactive whiteboard		
09	e-library		
10	Photocopy machine		
11	ICT-lab		
12	Web camera		
13	LMS		
14	Mobile phone (personal)		
15	Printer		
16	Scanner		
17	If any other(specify)		

2) Who has got responsibility to run the ICT lab?

   The headmaster ☐, teacher ☐, computer teacher ☐, anyone ☐

3) How many computers are there in the lab?

   One to five ☐, six to ten ☐, eleven to fifteen ☐, more than sixteen ☐

4) How many students can sit and work in the computer lab at a time?

   One to five ☐, up to ten ☐, up to fifteen ☐, more than sixteen ☐

5) Which of the following ICT-related tools do you use for teaching English? Please tick (✓) in the appropriate box to indicate the frequency of your use.

S N	**ICTs**	**Always** (more than 75% of your working days)	**Usually** (51% to 75% of your working days)	**Often** (26% to 50% of your working days)	**Sometimes** (up to 25% of your working days)	**Never**
01	Desktop					
02	Laptop					
03	Internet					
04	CD					
05	Multimedia projector					
06	Interactive whiteboard					
07	e-library					
08	Photocopy machine					
09	ICT-lab					
10	LMS					
11	Tablet					
12	Mobile phone (personal)					
13	Printer					
14	Scanner					
15	If any other(specify)					

6) Which of the following ICT software tools do you use for teaching English? Please tick (✓) in the appropriate box to indicate the frequency of your use.

S. N.	**Tools**	**Always** (more than 75% of your working days)	**Usually** (51% to 75% of your working days)	**Often** (26% to 50% of your working days)	**Sometimes** (up to 25% of your working days)	**Never**
01	E-mail					
02	Messenger					
03	Facebook					
04	YouTube					
05	Blogs					
06	Wiki					
07	Skype/Viber/audio-video talk					
08	Chat					
09	LMS					
10	Websites/web browsers					
11	Educational software programmes (online)					
12	E-Library resources					
13	Educational programmes/apps (offline)					
14	Any other(specify)					

7) What are the difficulties/challenges in the integration of ICTs into the classroom? Please tick (✓) in the appropriate box to indicate their importance.

S. N.	Difficulties/Challenges in ICT integration	Most important	Important	Less important	No important
01	Infrastructure				
02	Pedagogical/ Technological training				
03	Previous knowledge				
04	Economic Status of the learners				
05	Attitude of the stakeholders towards ICTs				
06	Administrative support				
07	Curriculum/Textbook				

Appendix B: List of Sample schools

Belbari Nagarpalika	Janata Ma V
Belbari Nagarpalika	Ranpal Adharbhut Vidyalaya
Belbari Nagarpalika	Sirijanga Pra V
Belbari Nagarpalika	Mahendra Adhar V
Biratnagar Mahanagarpalika	Janata Ma V
Biratnagar Mahanagarpalika	Dharanidhar Adharbhut Vidyalaya
Biratnagar Mahanagarpalika	Radha Krishna Bhupalman Singh Karki Ma V
Biratnagar Mahanagarpalika	Saraswati Ma V
Budhiganga Gaunpalika	Gyanodaya Pra V
Budhiganga Gaunpalika	Saraswati Ma V
Budhiganga Gaunpalika	Jana Priya Ma V
Budhiganga Gaunpalika	Madhu Gram Devta Adharbhut Vidyalaya
Dhanpalthan Gaunpalika	Bp Pra V
Dhanpalthan Gaunpalika	Kalika Pra V
Dhanpalthan Gaunpalika	Shiva Shakti Ma V
Gramthan Gaunpalika	Gram Dev Pra V

Gramthan Gaunpalika	Birendra Ma V
Gramthan Gaunpalika	Began Lal Adharbhut Vidyalaya
Gramthan Gaunpalika	Janata Pra V
Jahada Gaunpalika	Janata Ma V
Jahada Gaunpalika	Bhawani Pra V
Jahada Gaunpalika	Adarsha Pra V
Kanepokhari Gaunpalika	Sikshya Bikash Ma V
Kanepokhari Gaunpalika	Janamat Saraswati Adharbhut Vidyalaya
Kanepokhari Gaunpalika	Janata Adharbhut Vidyalaya
Katahari Gaunpalika	Jana Priya Ma V
Katahari Gaunpalika	Ramjanki Adharbhut Vidyalaya
Katahari Gaunpalika	Saraswati Adharbhut Vidyalaya
Kerabari Gaunpalika	Shanti Bal Sikshya Pra V
Kerabari Gaunpalika	Saraswati Ma V
Kerabari Gaunpalika	Bal Kalyan Pra V
Letang Nagarpalika	Surya Pra V
Letang Nagarpalika	Laxmi Ma V
Letang Nagarpalika	Saraswati Pra V
Miklajung Gaunpalika	Manohar Adharbhut Vidyalaya
Miklajung Gaunpalika	Singha Devi Adharbhut Vidyalaya
Miklajung Gaunpalika	Devkota Ma V
Patahrishanishchare Nagarpalika	Durga Pra V
Patahrishanishchare Nagarpalika	Chandra Kiranteshwor Ma V
Patahrishanishchare Nagarpalika	Panchayat Ma V
Patahrishanishchare Nagarpalika	Sunakhari Ma V
Rangeli Nagarpalika	Jaliya Pra V
Rangeli Nagarpalika	Ratna Ma V
Rangeli Nagarpalika	Saraswati Pra V
Rangeli Nagarpalika	Parwati Ma V
Ratuwamai Nagarpalika	Jana Kalyan Chetan Pra V
Ratuwamai Nagarpalika	Saraswati Ma V
Ratuwamai Nagarpalika	Maharajthan Pra V
Sundarharaicha Nagarpalika	Debata Adharbhut Vidyalaya
Sundarharaicha Nagarpalika	Saraswati Pra V
Sundarharaicha Nagarpalika	Janta Ma V
Sundarharaicha Nagarpalika	Shreelal Pra V

Sunwarshi Nagarpalika	Janaki Pra V
Sunwarshi Nagarpalika	Kali Uchh Ma V
Sunwarshi Nagarpalika	Triveni Pra V
Sunwarshi Nagarpalika	Ma V Bardanga
Uralabari Nagarpalika	Bhanu Adharbhut Vidyalaya
Uralabari Nagarpalika	Radhika Ma V
Uralabari Nagarpalika	Durga Ma V
Uralabari Nagarpalika	Sunpakuwa Ma V