Chapter 1
INTRODUCTION

1.1 Background of the Problem
1.2 Need and Significance of the Study
1.3 Statement of the Problem
1.4 Definition of Key Terms
1.5 Hypotheses for the Study
1.6 Objectives of the Study
1.7 Method and Design Adopted for the Study
1.8 Scope of the Study
1.9 Limitations of the Study
1.10 Delimitations of the Study
1.11 Organisation of the Report
1.2 Background of the Problem

“The technology itself is not transformative. It’s the school, the pedagogy that is transformative.”

( Tanya Byron )

The emergence of new technology has influenced every aspect of human life. Today, a classroom without technology is inconceivable. Due to these developments and evolution, standards of learning would be higher in the 21st century than it has been in the 20th century. In order to prepare the students to navigate the 21st century world they must be exposed to technology based instruction in the classroom. To be able to survive and be successful in the future school environment, teachers would need to acquire additional knowledge and skills, both general and specific, Teachers play a vital role in realizing the educational goals of a dynamic society. The Role of teacher is becoming more specific and specialized and yet demanding a new world order on account of the explosion of knowledge and expansion of skills. This would mean the need for increased professionalism among the incoming teaching community. This professionalism must be developed without hindering the humane nature that is inherent. Teacher Education for preparing humane and professional teachers needs to be wholistic. Along with content and methodology there is a need to integrate numerous skills and competencies. Due weightage should be given for the inculcation of emotional competencies, spiritual competencies, life skills, info-savvy skills, and techno-pedagogic skills in the teacher education curriculum.

Teacher education is based on the theory that “teachers are made, not born” in contrary to the assumption, “teachers are born, not made”. Since teaching is considered an art and a science, the teacher has to acquire not only knowledge, but also skills that are called “tricks of the trade” (Kaur, 2013). India has one of the largest systems of teacher education in the world. Besides the university departments of education and their affiliated colleges, government and government aided institutions; private and self-financing colleges and open universities are also engaged in teacher education. Though most teacher education programmes are nearly identical
yet their standard varies across institutions and universities. Education of teachers not only facilitates improvement of school education by preparing competent, committed and professionally well qualified teachers who can meet the demand of the system, but also functions as a bridge between schooling and higher education. The educational expansion, universalisation of elementary education, vocationalisation of secondary education, higher and professional education and overall quality of education are major challenges before the country. Evidently, the quality of education is a direct consequence and outcome of the quality of teachers and teacher education system. The task of bringing qualitative change in institutional efficacy of the teacher education system in itself is a huge and challenging one. The developments and changes over the last two decades require a fresh look at the teacher education. The need for improved levels of educational participation for overall progress is well recognised.

Teacher education encompasses teaching skills, sound pedagogical theory and professional skills. Teaching skills would include providing training and practice in the different techniques, approaches and strategies that would help the teachers to plan and impart instruction, provide appropriate reinforcement and conduct effective assessment. It includes effective classroom management skills, preparation and use of instructional materials and communication skills. Pedagogical theory includes the philosophical, sociological and psychological considerations that would enable the teachers to have a sound basis for practicing the teaching skills in the classroom. The theory is stage specific and is based on the needs and requirements that are characteristic of that stage. Professional skills include the techniques, strategies and approaches that would help teachers to grow in the profession and also work towards the growth of the profession. It includes soft skills, counseling skills, interpersonal skills, computer skills, information retrieving and management skills and above all lifelong learning skills. An amalgamation of teaching skills, pedagogical theory and professional skills would serve to create the right knowledge, attitude and skills in teachers, thus promoting wholistic development. In this era of technological expansions the amalgamation of technology and pedagogy leads to an important skill –techno-pedagogical skills. Techno-pedagogy or the powerful combination of various technologies and pedagogy provides new opportunities to support a range of learning environments.
Teacher’s education is in the transition phase because of the rapid change in technology and student’s changing values. A substantial effort is needed to understand the underlying dynamics of teaching and learning principles of students of the recent time. (Kanten & Ulker, 2013). Teacher’s education courses must incorporate the learning and teaching psychology of students and teachers respectively. Such courses should also incorporate the developmental stages of pre-service teachers to enhance their learning. Pre-service teachers are those scholars who aspire to build their career in the field of teaching. They should be educated in supportive and conducive environment in which they expect to educate and groom young students. Such courses should target to develop social consciousness and reform mindset among perspective teachers. Pre-service teachers should be able to teach confidently in their domain by using new pedagogical approaches that are appropriate to their specific student’s requirements and also commensurate with the capabilities of students. They should be conversant with the learning stages of their students and also be critical, compassionate and socially engaged knowledge imparters who can contribute in the process of teaching improvement and social change (Cochran, 2000).

Today there are new expectations for education where the focus is on having teachers be futurist leaders to ensure sustainable education. In the constructivist classroom, the teacher’s role is to prompt and facilitate discussion. Constructivism is a learning theory found in psychology which explains how people might acquire knowledge and learn. It therefore has direct application to education. The theory suggests that humans construct knowledge and meaning from their experiences. (“Constructivism - Learning and Teaching - The University of Sydney,” n.d.). Thus, the teacher’s main focus should be on guiding students by asking questions that will lead them to develop their own conclusions on the subject. The paradigm shift is from teacher dominated classroom practices to that of partnership between the teacher and the learners and their peers (Singh, 2014). The key role of educational institutions is reflected in a variety of initiatives taken to transform the nature and function of education—both formal as well as non-formal. Universal accessibility to quality education is considered essential for development. E-learning facilities and virtual learning environments solves the problem of access of education to the growing mass.

Smart classrooms and smart lessons are the highlights of new generation schools. Teacher professional development is absolutely essential if technology
provided to schools is to be used effectively. Simply put, spending scarce resources on informational technology hardware and software without financing teacher professional development as well is wasteful. Experience around the world in developing and industrialized countries has shown that teacher training in the use and application of technology is the key determining factor for improved student performance (in terms of both knowledge acquisition and skills development enabled by technology). Educational technology is not, and never will be, transformative on its own – it requires teachers who can integrate technology into the curriculum and use it to improve student learning. In other words, computers cannot replace teachers—teachers are the key to whether technology is used appropriately and effectively (Carlson, 2002).

Technology can promote effective instruction that is more student-centered, inter-disciplinary, more closely related to real-life events and processes, and adaptive to individual learning styles. Such instruction encourages development of higher-order thinking and information-reasoning skills among students, and socially constructed (collaborative) learning, all of which are increasingly required in today’s knowledge-based global economy. This potential of technology to improve instruction must be integrated into the design and delivery of teacher professional development programs in the use of technology.

1.2 Need and Significance of the Study

The National Council for Teacher Education has defined teacher education as a programme of education, research and training of persons to teach from pre-primary to higher education level. Teacher education is a programme that is related to the development of teacher proficiency and competence that would enable and empower the teacher to meet the requirements of the profession and face the challenges therein. An educational institution performs a significant function of providing learning experiences to lead their students from the darkness of ignorance to the light of knowledge. The key personnel in the institutions who play an important role to bring about this transformation are teachers. The teacher is the most important element in any educational program. It is the teacher who is mainly responsible for implementation of the educational process at any stage. This shows that it is imperative to invest in the preparation of teachers, so that, the future of a nation is secure. The importance of competent teachers to the nation’s school system can in no
way be overemphasized. The National Curriculum Framework (2005) places demands and expectations on the teacher, which need to be addressed by both initial and continuing teacher education.

Teacher education is concerned with the aspects such as, who (Teacher Educator), whom (Student teacher), what (Content) and how (Teaching Strategy). The quality of teacher educators is a prime factor in teacher education programmes. The quality of pedagogical inputs and their effective utilization for the purpose of preparing prospective teachers depend largely on the professional competence of teacher educators and the ways in which it is utilized for strengthening the programme. Teacher education, thus, first deals with the preparation of effective teacher educators. The training reaches out to the student teachers by providing the relevant knowledge, attitude and skills to function effectively in their teaching profession. It serves to equip the student teachers with the conceptual and theoretical framework within which they can understand the intricacies of the profession. It aims at creating the necessary attitude in student teachers towards the stakeholders of the profession, so that, they approach the challenges posed by the environment in a very positive manner. It empowers the student teachers with the skills that would enable them to carry on the functions in the most efficient and effective manner. Teacher education therefore pays attention to its content matter.

With the onset and proliferation of Information and Communication Technology (ICT), there is a growing demand of technology inclusion in education system. Today students are no longer the target audience what educational system was designed to teach. Internet instant messaging, video games, video conferencing and networking formed a substantial part of the native language of digital natives or net generation. Traditional education system barely engaged the minds and aptitude of digital natives in the twenty-first century classrooms. Therefore, a key questions need to be addressed by teacher’s education program such as how teachers learn and refine knowledge, skills and proficiency to teach such digital literate audience. Teacher education has been structured to orient and sensitize the teacher to distinguish between developmentally appropriate and detrimental uses of ICT. It needs to also equip teachers with competence to use ICT for their own professional development.
There are problems of quality perception, quality scaling and quality differentiation in Teacher Education. There is a significant variance between expected and actual quality. This gap is widening day by day. This is exemplified by the degradation levels in successive entrance tests for higher level, be it Graduate, Post-Graduate or Doctoral Level. There has to be adequate focus on all the systemic parameters input, process and output. The degeneration of quality of Teacher Education can be attributed more to the private sector. Unless the teacher education norms are observed sincerely by the society, nobody can help. (, 2012).

Technology usage where a teacher and learner is equipped with a portable, wireless electronic device capable of accessing internet content and enabling a wide range of digital collaboration methods across different place is the future of education. Younger generations raised in this ocean of digital information are familiar with the intricacies of digital world. At the same time they find life a bit unfamiliar and new without digital information and technological aid. Since the teacher is the pivot of the entire educational system and is the main catalytic agent for introducing desirable changes in the teaching learning process, all attempts need be made for motivating teachers to become innovative and creative. It goes without saying that a self motivated and really industrious teacher can utilize his own resources to keep himself abreast of new knowledge and skills. It has been recognized that teacher education program should be structured and modified in a way that enables them to respond dynamically to the demands of new generation who were born and brought up in the lap of technology.

At the societal level, expectations of what teachers should know and be able to do are increasing every year. Teachers not only have to know their subject matter and basic pedagogy, they are also expected to model higher-order thinking processes, work in interdisciplinary teams, and inculcate leadership and communication skills. Traditional teacher training approaches are simply not equipped to deal with all these new expectations. As the need and demand for teacher professional development increases, the key challenges will be ensuring content quality, reliable and appropriate training delivery infrastructure, follow-up support, measurable outcomes, and all at acceptable cost. These challenges can be answered by the blended learning approaches in education. Blended learning also known as hybrid, mixed mode,
Introduction

flexible or distributed learning, is gaining acceptance and being adopted throughout higher education.

Blended learning is gaining acceptance and being adopted at college campuses throughout the US (Bonk & Graham, 2005; Allen & Seaman, 2004). The availability of online technologies like course management systems, the recognition that the Internet is a valuable communications tool, the convenience and flexibility of having fewer campus meetings, and research on how we learn all seem to support the growth of blended learning. Some scholars argue blended could be more powerful and even transformative for higher education as compared to other forms of learning (Garrison & Kanuka, 2004; Bransford, Brown & Cocking, 2000; McCombs & Vakili, 2005).

Through blended learning a new instructional concept is getting developed and the role of teacher is really critical. Despite the recent advances of blended learning in the field of education, there is little research into how online learning is actually being used in educational institutions by blending face-to-face instruction or how learning platforms can benefit learning. As mentioned, several international studies have been conducted in the area of blended learning. Research review reveals that there is a lack of studies in Indian educational context on effects of blended learning strategy on teacher training programmes. Researchers in India have hardly explored this area of research.

The traditional way of teaching has made the teaching profession, a sluggish one. This type of teaching produces less competent teachers and in turn many of the youngsters are reluctant to take up teaching profession. Blended learning strategy is partially technology dependent and gives very big role to the teacher. This strategy provides opportunities to try other modes of alternative or supportive instructional channels with in our existing class room and school climate. In this context, it is critical to design a blended learning package for teacher trainees to enhance their techno-pedagogical skills and achievement.

Moreover, the felt need of the Investigator as a teacher educator in ‘Modern Educational Practices’ was the key motive behind the selection of the present study. In the prevailing system of curriculum transaction educational technology is been taught using lecture methods. Activity oriented methods were used occasionally, but they were also limited to the four walls of the classroom. Teaching technology
Introduction

without the access of technology is not a right choice of curriculum transaction. As a result of these ineffectiveness in curriculum truncation, far too many of us have witnessed computers in classrooms collecting dust; computer labs locked because there is no one trained to run them; students playing non-educational games on computers for hours on end. We need changes in the curriculum transaction modalities. A clear cut research on how to make use of latest techno-pedagogical innovation, in order to make a fantabulous result in teaching-learning process, is essential.

This study is very significant as it investigates the effectiveness of blended learning strategy in teacher education which is the foundation stone of all education. The novice teachers can be trained in all the modern hardware and software as well as their effective utilization to arouse the interest of the learners. This strategy will ensure mastery in learning and foster self regulated learning with latest study media and material available in the web, to make learning without burden, a reality.

1.3 Statement of the Problem

The quality of education we provide our children depends on the quality of teachers which in turn depends on the quality of teacher education programme. To be effective teachers, the trainees have awareness of recent developments in the field of educational technology. They should be trained, how to incorporate technology in the teaching process. While technology increases teachers’ training and professional development needs, it also offers part of the solution. Information and communication technologies (ICTs) can improve pre-service teacher training, by providing access to more and better educational resources, offering multimedia simulations of good teaching practice, catalyzing teacher to trainee collaboration, and increasing productivity of non instructional tasks. Key to successful teacher professional development programs is a package structure, corresponding to different levels of teacher experience and expertise using technology. Adapting materials to teachers’ comfort level and starting points is essential. In this way, student teachers, new to educational technology, can be exposed to the full series of professional development by giving exposure to the techno-pedagogy using online and offline resources.
Hence the topic for the present study is entitled as “DEVELOPING A BLENDED LEARNING PACKAGE FOR ENHANCING TECHNOPEDAGOGICAL SKILLS AND ACHIEVEMENT AMONG STUDENT TEACHERS AT SECONDARY LEVEL.”

1.4 Definition of Key Terms

**Blended Learning**: According to Christensen, Horn & Staker (2013) Blended Learning is a formal education program in which a student learns:

1. at least in part through online learning, with some element of student control over time, place, path, and/or pace;
2. at least in part in a supervised brick-and-mortar location away from home; and
3. the modalities along each student’s learning path within a course or subject are connected to provide an integrated learning experience.

**Operational Definition**: Here in the study by the term ‘Blended Learning’, the Investigator means learning that is facilitated by incorporating online learning in a virtual environment and a live classroom, with face to face interactions.

**Enhancing** means to improve or augment especially the effectiveness, value, or attractiveness (The Free Dictionary).

**Operational Definition**: In the present study enhancing means improvement or augmentation of effectiveness.

**Technopediaogy**: Literally, 'pedagogy' refers to the art or science of teaching and 'techno' refers to the art or skill in handcrafting, derived from the Latin word ‘texere’ (to weave or fabricate). Techno-pedagogy refers to weaving the techniques of the craft of teaching into the learning environment itself. (Koehler & Mishra, 2008)

**Technopedagogical Skills-Operational Definition**: Technopedagogical Skills refers to the skills needed to use technology for pedagogical reasons and competence to integrate technology into teaching. In the present study Techno-pedagogical Skills includes the following sub skills such as

a) Basic Technological Skills.
b) Technology Usage Skills for Knowledge Acquisition and Personal Development.
c) Technology Usage Skills for Planning and Preparing Lesson Plans.
d) Technology Usage Skills for Delivering Lessons.

**Achievement:** Achievement refers to the performance in school or college in a standardized series of educational tests. The term is more generally to describe performance in the subjects of curriculum (Page, Thomas and Marshall, 1978)

**Operational Definition:** Achievement stands for accomplishment or attainment in a particular field. In the present study the Investigator focuses on achievement of student teachers for the paper titled ‘modern educational practices’.

**Student Teachers at Secondary Level:** B. Ed. trainees of Mahatma Gandhi University.

1.5 **Hypotheses for the Study**

The following Hypotheses were formulated for the study.

1) The extent of Techno-Pedagogical Awareness among Student Teachers at Post Graduate Level is low.

2) The extent of Techno-Pedagogical Awareness among Student Teachers at Post Graduate Level is independent of

   a) Management of Institutions

   b) Optional Subject

   c) Locality

3) Blended Learning Package is more effective than Optimal Learning Model, Learning Management System and Activity Oriented Method in enhancing total Techno-Pedagogical Skills of Student Teachers at Secondary Level.

4) Blended Learning Package is more effective than Optimal Learning Model, Learning Management System and Activity Oriented Method in enhancing Techno-Pedagogical Skills of Student Teachers at Secondary Level with respect to different categories of Sub-Skills such as,

   a) Basic Technological Skills.

   b) Technology Usage Skills for Knowledge Acquisition and Personal Development.

   c) Technology Usage Skills for Planning and Preparing Lesson Plans.

   d) Technology Usage Skills for Delivering Lessons.
5) Blended Learning Package is more effective than Optimal Learning Model, Learning Management System, and Activity Oriented Method in enhancing Total Achievement in Techno-Pedagogy of Student Teachers at Secondary Level.

6) Blended Learning Package is more effective Optimal Learning Model, Learning Management System and Activity Oriented Method in enhancing Achievement in Techno-Pedagogy of Student Teachers at Secondary Level with respect to different categories of objectives such as,
   a) Remembering
   b) Understanding
   c) Applying
   d) Analysing
   e) Evaluating
   f) Creating.

7) Blended Learning Package significantly retains Techno-Pedagogical Skills of Student Teachers at Secondary Level in the post and delayed post stages.

8) Blended Learning Package significantly retains Techno-Pedagogical Sub-Skills of Student Teachers at Secondary Level in the post and delayed post stages.

9) Blended Learning Package is more effective than Optimal Learning Model, Learning Management System and Activity Oriented Method in retaining Total Techno-Pedagogical Skills of Student Teachers at Secondary Level.

10) Blended Learning Package significantly retains Total Achievement in Techno-Pedagogy of Student Teachers at Secondary Level in the post and delayed post stages.

11) Blended Learning Package significantly retains Objective-Wise Achievement in Techno-Pedagogy of Student Teachers at Secondary Level in the post and delayed post stages.

12) Blended Learning Package is more effective than Optimal Learning Model, Learning Management System and Activity Oriented Method in retaining Total Achievement in Techno-Pedagogy of Student Teachers at Secondary Level.
1.6 **Objectives of the Study**

1) To analyse the extent of Techno-Pedagogical Awareness among Student Teachers at Post Graduate Level.

2) To find the dependence of Techno-Pedagogical Awareness among Student Teachers at Post Graduate Level on
   a) Optional Subject
   b) Management of Institutions
   c) Locality

3) To develop a Blended Learning Package for Student Teachers at Secondary Level, by blending Optimal Learning Model and Learning Management System to enhance Techno-Pedagogical Skills and Achievement in Techno-Pedagogy.

4) To compare the effectiveness of Blended Learning Package with that of Optimal Learning Model, Learning Management System and Activity Oriented Method in enhancing Techno-Pedagogical Skills of Student Teachers at Secondary Level.

5) To compare the effectiveness of Blended Learning Package with that of Optimal Learning Model, Learning Management Systems and Activity Oriented Method in enhancing Techno-Pedagogical Sub Skills of Student Teachers at Secondary Level.

6) To compare the effectiveness of Blended Learning Package with that of the Optimal Learning Model, Learning Management System, and Activity Oriented Method in enhancing Achievement in Techno-Pedagogy of Student Teachers at Secondary Level.

7) To compare the effectiveness of Blended Learning Package with that of the Optimal Learning Model, Learning Management System and Activity Oriented Method in enhancing Objective-wise Achievement in Techno-Pedagogy of Student Teachers at Secondary Level.

8) To find the effectiveness of Blended Learning Package in retaining Techno-Pedagogical Skills at post and delayed post stages of Student Teachers at Secondary Level.
9) To find the effectiveness of Blended Learning Package in retaining Techno-Pedagogical Sub-Skills at post and delayed post stages of Student Teachers at Secondary Level.

10) To compare the effectiveness of Blended Learning Package with that of, the Optimal Learning Model, Learning Management System, and Activity Oriented Method in retaining Techno-Pedagogical Skills of Student Teachers at Secondary Level.

11) To find the effectiveness of Blended Learning Package in retaining Achievement in Techno-Pedagogy at post and delayed post stages of Student Teachers at Secondary Level.

12) To find the effectiveness of Blended Learning Package in retaining objective wise Achievement in Techno-Pedagogy at post and delayed post stages of Student Teachers at Secondary Level.

13) To compare the effectiveness of Blended Learning Package with that of, the Optimal Learning Model, Learning Management System, and Activity Oriented Method in retaining Achievement in Techno-Pedagogy of Student Teachers at Secondary Level.

14) To analyze the impact of Optimal Learning Model on its Nurturant effect among Student Teachers at Secondary Level.

### 1.7 Method and Design Adopted for the Study

The main objective of the present study is to develop a Blended Learning Package for enhancing Techno-Pedagogical Skills and Achievement among Student Teachers at Secondary Level. For attaining the objectives the Investigator used both qualitative and quantitative methods. The first phase of the study was conducted using survey method. In the experimentation phase, Quasi-Experimental design with ‘Pretest, Post Test Parallel Groups Design’ was to be employed in order to check the effectiveness of the developed package. So the study comprises Survey Cum Experimental Method.

#### 1.7.1 Research Population and Sample Selected

The Research Population of survey study consisted of Student Teachers at Postgraduate Level of Mahatma Gandhi University and the selected sample comprised of 410 student teachers from fourteen teacher training institutions under the
University. The Research Population of experimental study consisted of Student Teachers at Secondary Level of Mahatma Gandhi University and the selected sample comprised of 132 student teachers from two affiliated training colleges under the University. In addition, experts from the field of Information Technology and B.Ed and M. Ed teachers (N=16) were also included in the purview of study.

1.7.2 Data Gathering Tools used for the Study.

The following tools were used for the study.

1. Techno-Pedagogy Awareness Scale developed and standardized by the Investigator.
2. ‘Blended Learning Package (BLP) on ‘Modern Educational Practices’ by blending Optimal Learning Model (OLM) and Learning Management System (LMS) developed and validated by the Investigator.
3. Observation Schedule for evaluating the Nurturant effects of Optimal Learning Model
4. Evaluation Pro forma for Validating the Blended Learning Package (BLP)
5. Lesson transcripts based on Activity Oriented Method (AOM) on ‘Modern Educational Practices’ for student teachers
6. Techno-Pedagogical Skill Test developed and validated by the Investigator
7. Achievement Test in Techno-Pedagogy developed and standardized by the Investigator

1.7.3 Statistical Techniques Employed for the Study

Statistical procedures help the Investigator to frame the conclusions of any research study. For the present study, the following statistical techniques were employed by the Investigator for the analysis of data that leads to conclusions.

• Descriptive Statistics
• Percentage Analysis
• Chi-Square test of Independence
• Analysis of Variance [ANOVA]
• Analysis of Covariance [ANCOVA].
• One-way Repeated Measures ANOVA using Sidak Correction
1.8 Scope of the Study

The present study aims to develop Blended Learning Package for Student Teachers at Secondary Level, by blending Optimal Learning Model and Learning Management System to enhance Techno-Pedagogical Skills and Achievement in Techno-Pedagogy. The development of new methods of teaching and learning in schools and higher education has been rapid by the revolutions in the field of information technology. The last decade in particular has seen an explosion on a wide variety of methodological innovations such as resource-based learning and resource centers, independent and distance learning education based on computers such as e-learning, virtual learning and blended learning. These developments are significant not only for the content of teacher education, but also for its methods. In other words, there is no point in telling teachers about innovative methods, it is far more effective to use them. The use of ICT in education improves the quality of education and brings about desirable changes both qualitative and quantitative. Teacher education needs to imbibe the skill of using computers more than anybody else in the educational setup because these teacher educators are the persons who mold the students and the input in the process of education. Therefore it is a need to train teachers in the use of computers to get good results in the field of education.

ICT is a potentially powerful tool for extending educational opportunities, both formal and non-formal. ICT greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution. ICT especially computers and internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning constitute a shift from a teacher-centered pedagogy in its worst form characterized by memorization and rote learning to one that is learner-centered pedagogy. ICT supported education can promote acquisition of the knowledge and skills that will empower students for lifelong learning.

The effective and efficient use of ICT depends on technically competent educators/teachers. Education for modernization involves developing original
thinking and modern thinking. Blended learning ensures this by utilizing web resources without hindering face to face instructions. In the present study, within the confines set by the experimental design, all possible precautions have been taken to attain the highest degree of accuracy in the findings.

1.9 Limitations of the Study

Limitations are matters and occurrences that arise in a study which are out of the researchers control (Simon & Goes, 2013). They are the shortcomings, conditions or influences that cannot be controlled by the researcher that place restrictions on the methodology and conclusions. Even though the Investigator ensured internet connectivity and power supply facilities prior to experimentation, unexpected power failure and connectivity problems pertained during course of study was the major limitation of the study.

1.10 Delimitations of the study

The delimitations are those characteristics that limit the scope and define the boundaries of the study. The delimitations are in the control of the Investigator (Simon, 2011). Though possible steps were taken to make the study an objective one, certain delimitations that have crept into the study have been identified in this session. The major delimitation that pertained the study was the selection of the sample. Due to time constraints and geographical parameters the study was confined to a sample of 132 students from two training colleges. Another delimitation was regarding the assessment of techno-pedagogical skills. Only computer related skills have been studied by the Investigator. Other skills such as operation of OHP, effective use of educational media etc were omitted due to technical reasons. Even though MOODLE LMS provide wide range of learning opportunities, in the present study the Investigator selected the LMS just as a platform of content transactions. While acknowledging the above limitations, it is expected that the study would yield valid findings and substantial suggestions for educational improvement.

1.11 Organisation of the Report

The report of the study is presented in six chapters
Chapter-1 Introduction

This chapter consists of a general introduction highlighting the significance of teacher education with special reference to usage of technological innovations in the field of teacher training. This chapter also presents the reason for selecting the problem, statement of the problem, definition of key terms, objectives of the study, hypotheses for the study and a brief discussion on the scope, limitations and delimitations of the study.

Chapter-2 Theoretical Overview

This chapter deals with the theoretical basis of Blended Learning, Optimal Learning Model Learning Management System and Techno-Pedagogy.

Chapter-3 Review of Related Literature

A brief review of the related studies as well as the scholarly works done by researchers with more proximity to the present one are included in this chapter.

Chapter-4 Methodology

It discusses about the methodology adopted for the study including the variables used, design of the study, selection of sample, preparation of materials and tools used for the study and the statistical procedures adopted.

Chapter-5 Analysis and Interpretation of Data

It deals with the analysis and interpretation of data collected during the course of the study.

Chapter-6 Summary of Findings, Conclusions and Suggestions

This chapter presents the summary of the procedures adopted for the study followed by conclusions, educational implications and suggestions for further research.

The Report is followed by the Bibliography and series of Appendices