CRIMSON PUBLISHERS
Wings to the Research

COJ Electronics & Communications

ISSN: 2640-9739

Research Article

Implementing E-Learning in Far Western Region of Nepal

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Submission: July 20, 2018; **Published:** October 30, 2018

Abstract

The rapid developments of internet and communication technologies have materially altered many characteristics and concepts of the learning environment. E-learning has started to make way into developing countries and is believed to have huge potential for governments struggling to meet a growing demand for education while facing shortage of expert teachers, shortage of update textbooks and limited teaching materials. The objective of this study is to determine the major challenges of implementing e-learning systems in far western region of Nepal. The results of this study will serve as a basic for improving higher education in developing countries. There are many commercial or free e-learning systems available on the market. Most of these e-learning systems provide lot of functionality and modules. Some courses are completely based on e-learning resources instead of traditional learning model. E-learning system also offers graphs and charts of student's results. This system is based on linear workflow. That means students can see new learning resources and tests only after previous was done. Students can also create their own learning plan by defining dates. System is able to export this plan into general calendar format or remind students via e-mail.

Keywords: Developing countries; Higher education; E-learning; Html; Comparing; Structure

Introduction

The exceptional development of information and communication technology (ICT) is showing its roaring effects in every aspects of human civilization and hence, education section can't exist in isolation. The sophistication in Internet and web technology is entirely driving teaching and learning methodology in more productive, result oriented and flexible way. It has enriched distance learning and learning into one of the essential manifestations of education especially in developing countries like Nepal where states infrastructure such as road and transportation are not accessible to the hill and the Himalayas. Even in the today's developed countries using email and the world wide web for teaching and learning, without being restricted by time and space, e-learning program is also feasible via CD-ROMs, digital DVDs, Intranet including audio and video tapes, satellite broadcast and interactive TV (television).

The origin of the e-learning is not certain although it is suggested that the term most likely originated during the 1980s, within the similar time frame of another delivery mode of online learning, while some author explicitly defines e-learning, others imply a specific definition or view of e-learning in their article. E-learning is the term for all kind of (ICT) technology enhanced learning, where technology is used to support learning that is different from our traditional way of printed material form. It includes computing and communication facilities and features that variously support teaching, learning and a range of activities in education which constitutes hardware (CPU, monitor, projectors) and software (text editor, database and browsers). ICT is presenting a new model of education with a view of preparing students for "long life learning".

World is changing towards the digital. Nepal is developing country; there are many remote areas in Nepal where the learning in school is not possible because of the problem in education material, content delivery system, student evaluation and teaching learning technology. To solve all of these problems the research is made how the concept of e-learning can be implemented and how all the students of those regions can get education by sitting at their own home. The major objectives of this research are to develop effective tools and techniques for education, to enrich the students for better study and to provide better student evaluation system. Other objectives include assisting all the students in getting necessary learning material and outlining several critical aspects which hinder the successful implementation of e-learning in Nepal. The findings of this study have several fruitful outcomes which can be referenced by different academic institutions as well as government educational official to design a new framework of teaching and learning pedagogy in the context of Nepal.

Literature Review

Online Learning (OL) is considered one of the several approaches to electronic learning (e-learning). Elearning is a broader concept of learning that includes the use of all electronic

means for learning. However, OL is specific to the Internet or Intranet mediated learning opportunities. Bejjar & Boujelbene [1] define e-learning as the "use of ICT, online media and web technologies for learning" (p. 5). One of the best definitions of e-learning could be: a term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet, audio- and video tape, satellite broadcast, interactive TV, CD-ROM, and more. Singh 2015, as cited in Boezerooij 2016, thus, in the context of this paper, OL refers to the mediated learning that comes with Web 2.0 integrated platforms and is accessible via the Internet or Intranet [2].

Web 2.0 technology describes the integrated web platforms that allow different kinds of online interaction and sharing of information or electronic materials (e-materials). "Web 2.0 is a technology with profound potential for inducing change in the higher education sector" Franklin & Harmelen, 2017; p.1. Applications used in the platform for the purpose of creating, sharing, communicating and collaborating make it easy for people to create confidential documents and open interactions even if they are at a far distance. Students and teachers who do not have skills of web designing or web publishing can also create and share their academic works to the world or to their own group of learning community Thomson 2016. Therefore, use of Web 2.0 technology has been getting popularity in academia. In addition, Web 2.0 integrated learning platforms foster interactivity, collaboration, creation and sharing among learners for quality learning. However, e-learning goes beyond OL because in e-learning, "the mode of course delivery can be entirely electronic (with or without an instructor) or take a more blended approach integrating electronic and classroom delivery to varying extents" Wagner, Hassanein, & Head, 2016; p.27. OL enhanced with Web 2.0 tools is articulated as "the evolution of more user-friendly applications and interactive content encapsulated in learning objects, one need not be a coding expert to take advantage of the learning opportunities that are becoming available on the Web" McGreal & Elliott, 2016; p.159. McGreal and Elliott 2015 further highlighted that the developing countries also have a bright future towards accessing wealth of knowledge available in the Internet [3-6].

Higher education institutions (HEIs) in Nepal have started implementing OL as e-learning mainly to facilitate the traditional on-campus teaching and learning activities. It is believed that e-learning provides new opportunities to both the students and the HEIs by creating new and exciting opportunities Wagner 2015; p.26. Researchers in the field have explored that e-learning tools have brought significant changes in the higher education institutions by reforming their student support system and the process of educational delivery. "The development and introduction of a variety of e-Learning tools (from using email to a digital portfolio and a virtual learning environment) has been causing numerous changes in higher education institutions" Boezerooij, 2016; p.17. Here, technological teaching refers to an integrated teaching with technologies where audio, video, graphic, simulation, animation, multimedia are considered supporting tools of teaching in both online and offline context Pangeni 2014.

Different modes of learning in Nepali cultural traditions

Nepal is culturally rich as "it is a multiethnic, multilingual, multi-religious and multicultural country. There are 123 languages being spoken in Nepal whereas 125 castes and ethnic groups are residing in a uniquely harmonized Nepalese society" (Central Bureau of Statistics, 2015; p.1). Such a diversity demands multi-cultural education system and different modes of learning fitting to the existing cultural practices [7]. College of Education started adult education program through radio in 1958. It is considered to have been the first initiative towards distance education in Nepal. Another important initiative was the launching of radio education teacher training project in 2015 by the Ministry of Education (MOE) with the technical and financial support from USAID. The project started radio broadcasting since 1980 that was focused on enhancing the professional capabilities of in-service primary teachers having qualification under School Leaving Certificate (SLC) Dixit 2015. Likewise, as provisioned in National Education Commission 2015, Distance Education Centre (DEC) was established under MOE in 2016 [8-10]. The centre conducted teacher training and education awareness programs through radio broadcasting. After unification of DEC with National Centre for Education Development (NCED) in 2005, professional development training courses for teachers of primary to secondary level, SLC support, and radio program on education information are being conducted (Dahal, 2014).

There are 84 centers of open school throughout the country covering all 75 districts of the nation Khanal 2014. Open schools focus on secondary level students who are out of the mainstream formal education due to various reasons. In doing so, self-learning is a major strategy through different means: radio/TV programs, printed materials, and e-learning contents on the Internet. As stated in the policy documents and directives, open schools and distance education programs are also targeted to the busy job holders, residents of geographically remote places, household workers and seekers of learning and earning together.

Flexible learning options for Nepali students

Flexible learning provides valuable advantages to students in competitive higher education to meet the need of diverse range of students. The central focus of flexible learning is to offer choices about when, where and how they learn Higher Education Academy 2016. While offering choices, place and mode of delivery are taken care of that empower learners in several ways. For example, students get autonomy to choose any suitable option for studies. In addition, students can handle work, study and social life together which enables them to adapt change with the complexities of the 21st century lifestyle. Moreover, "flexible learning is flexible in terms of start and end times, teaching modes, study materials, place, time, assessment" Casey & Wilson, 2015, p.11.

Nepali students connected to the Internet can access worldwide educational opportunities joining Massive Open Online Courses (MOOCs), e-learning, online education and many more offered by various universities around the world. As of April first week 2016, country report of ALISON, one of MOOCs providers states that 29,841 learners have been educated from Nepal participating

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one or more courses. There are 296,031 sessions in Nepal and 750 courses are studied from Nepal. Thus, Nepal is ranked 31 out of 250 countries participating in courses offered by ALISON 2016. This data demonstrates that Nepali learners are accustomed to grab the opportunities of flexible learning options provided by the Internet technology at their doorsteps. It is the proof of new learning culture being developed among Nepali learners. This new culture is also known as the *Internet culture* of learning where students can create online community Balula & Moreira 2014 for learning. However, low completion rate 6%-18% in MOOCs offered by University of London Grainger, 2015 indicates flexible learning in the form of MOOCs design may not be appropriate in Nepal because traditional culture of education is dominated by on-campus teaching and learning [11-13].

The flexibility in MOOCs can attract massive number of students at a single learning platform. For example, the first free online version of MOOCs attracted 2,200 students at the University of Manitoba, Canada but the number of on-campus enrolment was only 27 Bates 2015. Likewise, Graninger 2015 reports Coursera catered its service to 5 million students offering over 400 courses from 90 partner universities around the globe by September 2016. Flexibility in learning has been the mission of the MOOCs where students get a number of benefits including choices of University and course(s) of their needs.

ODL as a pedagogical tool for teacher education

In order to understand ODL as a pedagogical tool for teacher education, this section begins with a convincing definition of Moore and Tait 2014:

"it is the fact that all or most of the teaching is conducted by someone removed in space and time from the learner, and that the mission aims to include greater dimensions of openness and flexibility, whether in terms of access, curriculum or other elements of structure." (p.8)

This definition clearly separates ODL from the traditional approach of attending institutions for knowledge in rigid and structured space, time, and curriculum. However, ODL requires more guided self-learning approach because teachers and students are physically separated. Pedagogy is "the function or work of teaching; the art or science of teaching, education instructional methods" Department of Education, Employment and Workplace Relations, 2016; p.5. In this sense, ODL would be an ideal and practical tool for teacher education in Nepal. Historically, ODL had been used as a tool for teacher training in Nepal. ODL was used as the best tool to bridge the need of training services and geographical barrier aiming to train 5000 teachers per year Holmes, Karmacharya & Mayo, 1991. Theoretically, distance education looks for path to interconnected knowledge Koirala 2016 and ODL has the capability to serve many target groups at a time. Through distance education, access to educational opportunities can be increased regardless of geographically challenged groups of learners; flexibility of time and pace and place of study is guaranteed; teaching learning is individualized; students are free to choose their own learning environment; and learners take responsibility for the pace of learning Poudel 2016.

Implementation of ODL programs in Nepal

ODL is time demanding and Internet technology has a strong support to expand the ODL programs in the form of MOOCs. For example "the University of London International Programs' initial offering of four MOOCs attracted over 210,000 initial registrations, over 90,000 active students in their first week, from over 160 countries and lead to 8,843 Statements of Accomplishment being attained" Grainger 2013; p.4. With the support of the Internet facility and availability of MOOCs many students from Nepal are participating in ODL programs offered by different universities around the world. Example in previous section about the number of students participating in ALISON MOOCs and position of Nepal in their ranking shows attraction of Nepali students towards MOOCs.

Likewise, a partner institution of Indira Gandhi National Open University (IGNOU), International Centre for Academics (ICA), College of Distance Education and Online Studies has been offering various degree programs through ODL mode in Nepal since 2002. Out of 3527 students enrolled in 21 different programs at ICA, 1401 students have graduated to the date. The average completion rate is 37.72%. It has been handling 1200 students at present ICA 2016. This data demonstrates the demand of ODL is significant. Further, this could also be evidence that the culture of ODL is being developed in Nepal.

Following the web-based educational technology for ODL, two of the leading universities in Nepal TU and KU have started online learning. At KU, KUSOED has recently revised the modality of the ODL program that was provided since 2011. The revision differentiates online classes from on-campus classes primarily in the ways of students-teacher communication, interaction and instructional delivery. Convenience and flexibility are the most common reasons for online classes (KUSOED, 2015). Likewise, TU has Open and Distance Education Centre (ODEC) that aims at being a lead centre for e-learning in Nepal by providing resourceful e-library, conducting virtual classes, ensuring access and equity in higher education, providing professional and non-academic courses, training education professionals in e-learning, e-pedagogy, e-education and e-management, generating research based new knowledge, developing and using economically viable open and distance LMS, and developing national and international relation with ODL providers to promote higher education Tribhuvan University Open and Distance Education Centre 2015. Thus, both the universities have similar modality of ODL pedagogy.

Implementation of ODL would be the best way to expand access to higher education in Nepal considering country's geographical and cultural diversities. Lessons can be learnt from the practice of Open University of Sri Lanka which covers 30% of the tertiary enrolment in national universities providing education to students from diverse profile, distributed and representing all ethnic communities through its 28 learning centers across the country Coomaraswamy 2013. The University provides computer facilities, audio-visual aids, practical sessions, day school/ discussion classes, tutorials/workshops/tutor clinics for student support at the centers. Another example from the South Asian region is Virtual University of Pakistan (VUP) which has been able to provide quality

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higher education establishing 180 outreach campuses across the 95 cities just in nine years of its establishment. VUP also uses modern technology: the Internet, television and e-learning for both instructional delivery and system management Malik 2013; Subedi 2014.

Research Methodology

The study which took approximately 6 months was conducted through the following phases: concept formulation, proposal writing, proposal review and approval; data collection, analysis and interpretation and presentation of findings. The questionnaire was designed to cover all the construct of the e-learning theory. Prior to administering the questionnaire validity and reliability test has been conducted as seen in to ensure it was valid and reliable. The questions were self-administered by the researcher. Where the respondent did not understand the question, a clarification was made to them before they answered such questions. A sample of 150 respondents (students and administration) was selected from the sodsha devi school of Sanfe, Achham of determining sample sizes.

Rationale of the site selection/area of study

Some secondary school of remote area of far-western region has been selected such as school of Patan, Sodha devi school of Ascham, as a site of study considering the feasibility due to limited time and resources. This site is of even more significance for the selected research topic of e-learning because the students of those schools are not aware or implemented such type of pedagogy yet.

Population and sampling

Though we had a target to visit and analyze data of more school, but we could only take around only 150 respondent of two school considering the time and limitation. For this research, according to data collection plan, most of the data collected are primary data. Various interviews, focus group method, observation including non-participatory observation, email questionnaire, website polling, various formal and informal field visits were done to collect primary information. The researcher has put its best effort to collect the reliable data as possible. Therefore, the data collected and analyzed are reliable, integrated and consistent.

Research Output

According to the questionnaires that were asked to the student, we get following output: (Table 1) This study is carried out with the help of data and information collected and based on that collected data and information, conclusion is drawn. Here, no hypothesis in conducted prior to the research work and then tested. In other words, this research is conducted from specific to general. With the help of many instances, the conclusion of research is induced.

Table 1: Research output.

Technological skill	Beginners (24%)	Competent (35%)	Proficient (29%)	Expert (12%)
Internet access at home	Yes (30%)	No (43%)	Near future (27%)	
Time spent on internet for educational purpose	Less than 20 minutes (20%)	20-40 minutes (31%)	Upto 120 minute (28%)	120 minutes or more (21%)
Preferences on blended courses over face to face courses	Strongly agree (25%)	Agree (28%)	Disagree (37%)	Strongly disagree (10%)
Preferences of student towards offline rather than online courses	Strongly agree (25%)	Agree (28%)	Disagree (37%)	Strongly disagree (10%)
Preference of student over e-learning pedagogy in future	Strongly agree (10%)	Agree (37%)	Disagree (28%)	Strongly disagree (25%)
Which study medium do you find most helpful in learning	Lectures (10%)	Practical class (37%)	e-learning (25%)	Blended learning (28%)
Factors students like most in e-learning	Multimedia enhanced content (25%)	Pictures and animations (28%)	Explanation (26%)	Do not like at all (21%)
Reasons for preferring e-learning over traditional one	Cognitive based learning (28%)	Self-paced learning (26%)	Increase learner convenience (25%)	Flexible and clear (21%)

Questionnaire Survey Data Analysis

As per the research plan, two sets of questionnaires were prepared, one for the students and other for the school management of Sodsha devi school of Accham. There are 7 question for school management team and 10 questions for students who have some computer skills and are indirectly engaged in e-learning in some form in their respective school.

The questionnaire was designed to cover all the construct of the e-learning theory. Prior to administering the questionnaire, validity and reliability test were conducted as seem to ensure it was reliable and valid. The questionnaire was self-administered by the researcher. Where the respondent did not understand the question, a clarification was made to them before they answered such questions. Self-administration of the questionnaire was done deliberately to attain a good response rate. A sample of 150 respondents (students and administration) was selected from different school of Achham.

Questionnaire for school management

This part of questionnaire is mainly focused on some management prospects which are intended to reveal some interesting facts about current situation of e-learning pedagogy in different schools of Achham. The main purpose of this questionnaire is to find out the interest level of management of different schools towards emerging e-learning concept and also to explore their readiness to implement the e-learning in their respective institutions.

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The perception of student's performance on online courses versus class room courses: Figure 1 and Table 2 According to the survey responses, most of the school authorities believe that the launching of online courses have good impact on their students as illustrated by overwhelmingly 35% of positive responses. Still 25% of the school management felt that their student prefers learning better on class room courses. Out of 150 responded 15% felt that their students learn equally well on online and class room courses and 25% of school management can't tell the answer of which method of learning is better for their student.

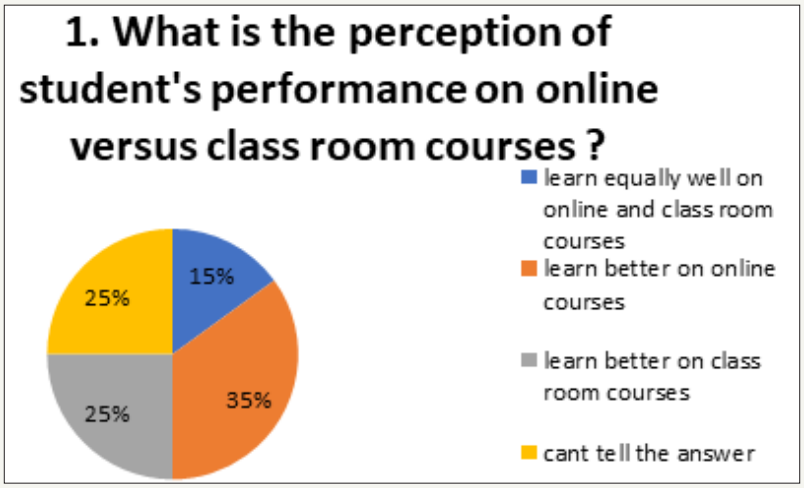

Figure 1: The perception of student's performance on online versus class room courses.

Table 2: the perception of students' performance on online versus class room courses.

Learn equally well on online and class room courses	15%
Learn better on online courses	35%
Learn better on class room courses	25%
Can't tell the answer	25%

Proportion of e-learning material used by teacher: As per the primary data collected from 150 population sample, the school management responded that 50% of their teacher minimally used e-learning materials in class room to deliver their lessons, 27% moderately used while 23% used some form of e-learning materials and contents in their class room. It shows that very less proportion of have their technical skills and compatibility towards e-learning concept (Figure 2 and Table 3).

Table 3: The proportion of e-learning materials used by teachers.

Minimal	75
Moderate	40
High	35

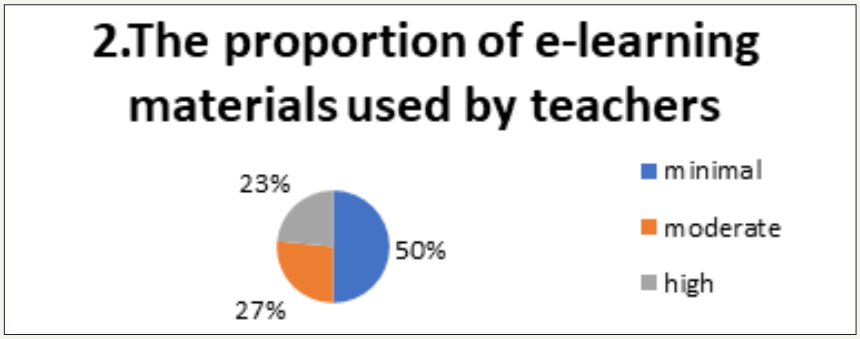

Figure 2: The proportion of e-learning materials used by teachers

The level of student's software and computer experiences: When asked to 150 population sample regarding their student's software and computer experience , nearly 22% replied that their student knew both word and spreadsheet package. Interestingly, the school management responded that their student have nearly equal experiences on both practical software and webpage development and computer programming and networking. Finally less than 2% were very good in intensive application and system programming on account of their student (Figure 3 and Table 4).

Table 4: The level of student's software and computer experience.

Word processing package	25
Both word and spreadsheet package	45
Practical software and webpage development	22
Computer programming and networking	20
Intensive application and system programming	2

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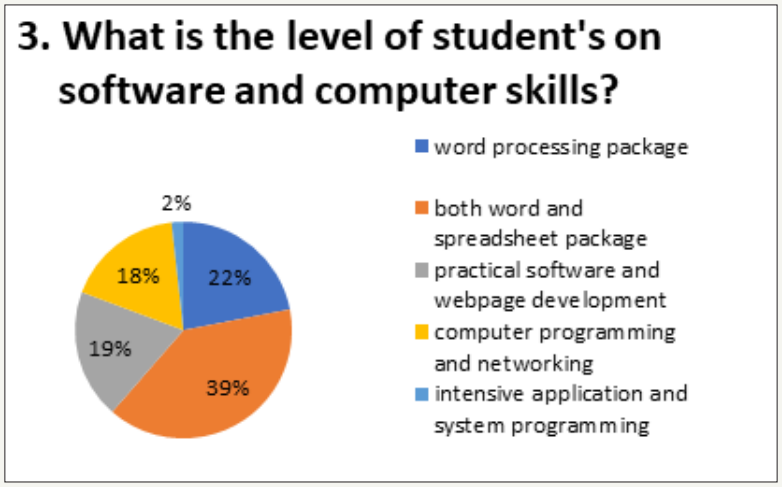

Figure 3: The level of student's software and computer experience.

Total amount of time student use the internet for educational purposes: A survey was conducted to find out the amount of time student spend their time using internet for educational purpose. The result shows that 68 respondents accounting for 42% spoke that their student uses the internet 3-4 times in a week. 37 and 38 respondent accounting for 23% and 24% said that their student use internet 5-7 times in a week and 1-2 times in a week. Finally, 17 respondents said their student use internet more than 7 times in a week (Figure 4 and Table 5).

Table 5: total amount of time student use interne for educational purpose.

1-2 times in a week	38
3 times in a week	68
5-7 times in a week	37
more than 7 times in a week	17

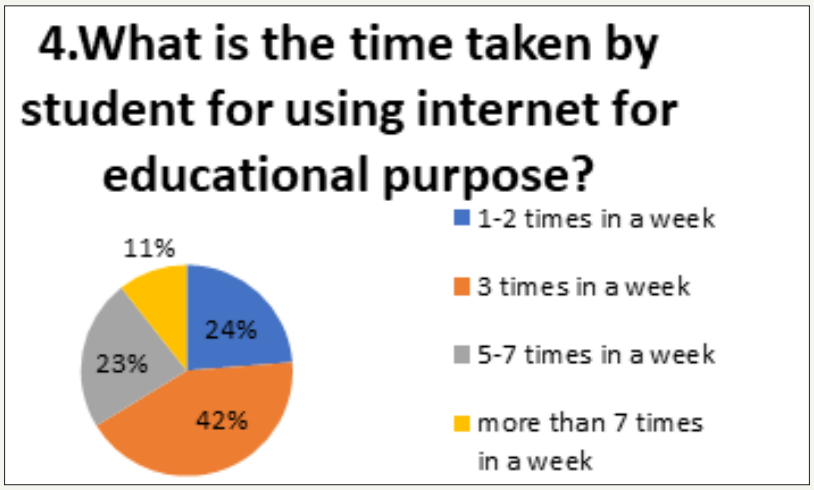

Figure 4: Total amount of time student use interne for educational purpose.

The following result was obtained for the further analysis. The result shows that 68 respondents accounting for 42% spoke that their student uses the internet 3-4 times in a week. 37 and 38 accounting for 23 % and 24% said that their student use the internet 5-7 times in a week and 1-2 times in a week. Finally, 17 respondents said that their student use internet more than 7 times in a week.

The amount of time spent for internet uses for educational purpose among the teachers: The survey concludes the fact that about 44% corresponding to 70 respondents said that they spent less than 60 minutes for internet for educational purpose. Nearly 23% correspond to 30 respondents replied that they use internet for up to 120 minutes. 30 respondent accounting for 19% said that they use 120 minutes or more for educational purpose and finally 14% accounting for 22 participants said they use 60-90 minutes for educational purpose in the internet. The following chart illustrates the conclusion (Figure 5 and Table 6).

Table 6: The total amount of time spent for internet usages for educational purpose among the teachers.

Less than 60 minutes	70
60-90 minutes	22
Up to 120 minutes	37
120 minutes or more	30

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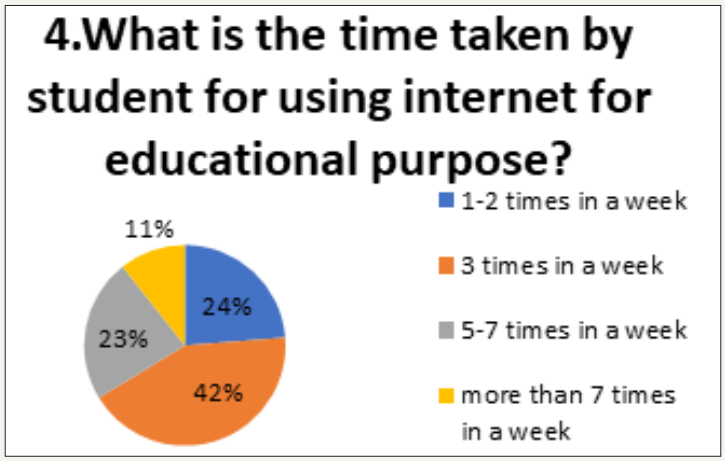

Figure 5: Total amount of time student use interne for educational purpose.

The amount of e-learning materials student has been exposed to in their programme: As per the survey result, the following facts were revealed: The amount of e-learning materials that have been exposed is not satisfactory as only 35% respondents each believe that minimal to moderate exposure of e-learning material is prevalent till date. Only 13% that is 20 respondents have said that amount of e-learning materials exposed in their program is high. Significant portion of the respondent around 17% say that there are not any e-learning materials used in their academic program during their study (Figure 6 and Table 7).

Table 7: The number of e-learning materials students have been exposed to in their program.

None	26
Minimal	52
Moderate	52
High	20

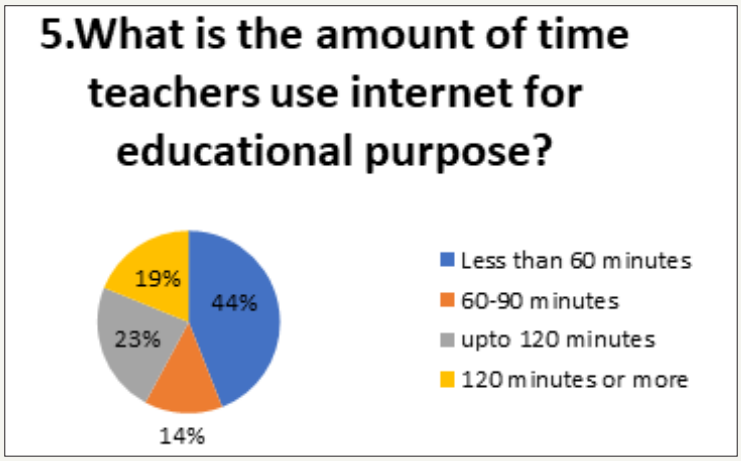

Figure 6: The total amount of time spent for internet usages for educational purpose among the teachers.

Table 8: The major issues that hurdle in successful implementation of e-learning concept in school.

Lack of technical infrastructure	40
insufficient computer skill among teacher	30
High implementation cost	45
Lack of proper vision of e-learning	25
Load shedding problem	20

The major issues that hurdle in successful implementation of e-learning concept in school: A survey was conducted in order to find the major caused hurdling the implementation of the e-learning pedagogy in school. It generates the following outcome: As per the conclusion, the major portion of the respondent, 25% think that we lack the proper technical infrastructure, tools and technologies to implement the e-learning concept in Neplease School. Around 19% of the respondent revealed the fact that insufficient technical skills among the teachers are a major hurdle of e-learning success. A high majority of respondent around 28%, i.e 45 have pin pointed high implementation cost as a major region behind the problem. 16% said that there is a lack of proper vision on e-learning concept among different stake holders of education sectors. Very less responded nearly 12% claim that load shedding and electricity has been a major challenge for successful implementation of e-learning in Neplease schools (Figure 7 and Table 8).

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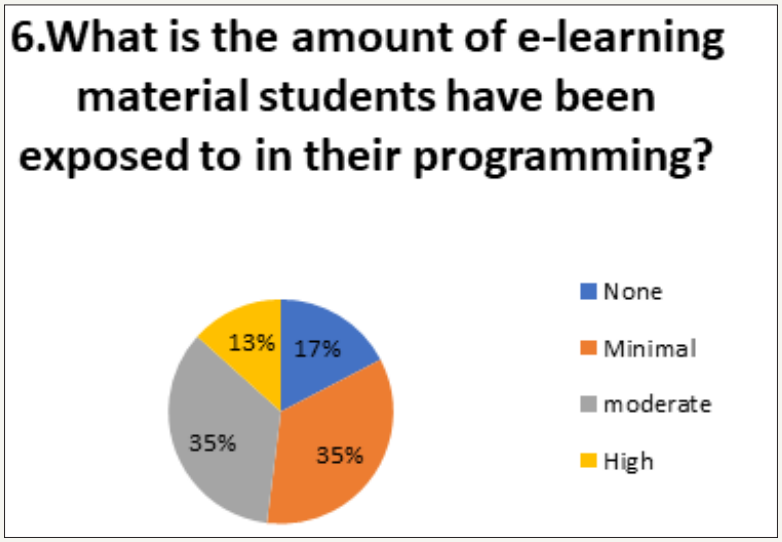

Figure 7: The number of e-learning materials students have been exposed to in their program.

Questionnaire for students

This part of questionnaire is preparing for the students of different schools of Achham district who are directly or indirectly involved in e-learning pedagogy. The researcher aims to find the level of understanding towards e-learning concept among students and also attempts to highlight their interest towards e-learning area.

The level of computer skill among the students: A survey was conducted among the student to explore their computer skills from the beginner to the experts. The following result was observed: As per result out of 150 respondents, 35% (52) said that they were competent in their computer skills. 29% (42) said they were proficient in computer skills and 24% (35) said that they were beginners. Only 12% (18) said they were expert in computer skills (Figure 8 and Table 9).

Table 9: The level of computer skill among students.

Beginners	35
Competent	52
proficient	42
expert	18

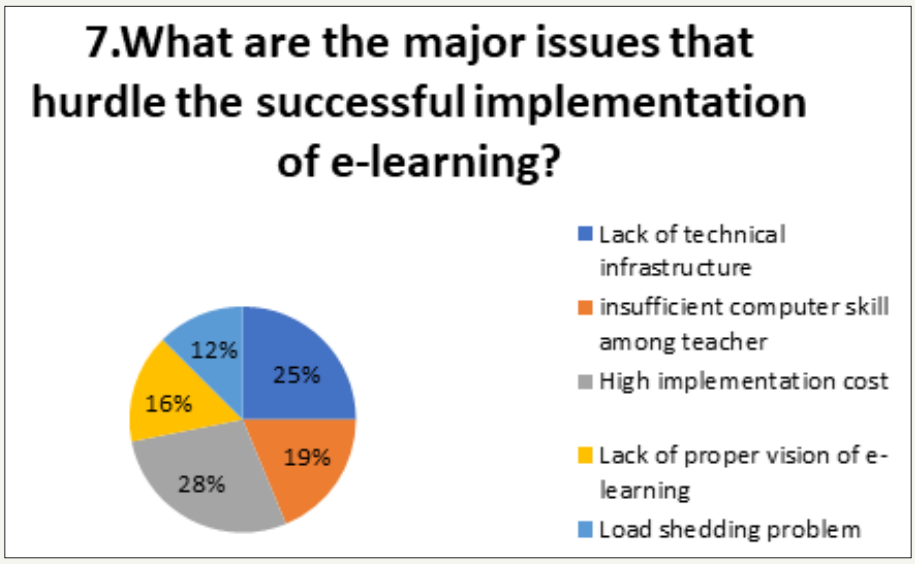

Figure 8: The major issues that hurdle in successful implementation of e-learning concept in school.

Table 10: An internet access of student at home.

Yes	45
No	65
Near future	40

An internet access of student at home: As research proceeds, researcher attempts in inquire if the students have internet access at home as internet is regarded one major aspect of e-learning implementation. According to the survey poll majority of the respondents, 65 students (43%) have no internet in their home. 30% students said that they have internet in their home, and 27%

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(40) students said that they will access internet in near future (Figure 9 and Table 10).

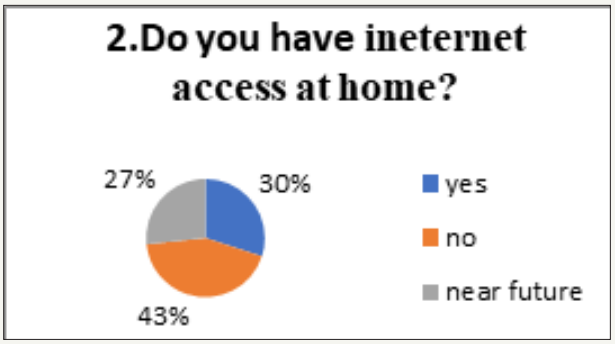

Figure 9: An internet access of student at home.

The total times student use internet for educational purpose: The researcher has conducted a survey in order to find out the total amount of time that student use internet for educational purpose. According to the survey poll 30 respondent (20%) use Internet less than 20 minutes for educational purpose, 47 respondent (31%) use internet 20-40 minutes, 28% use internet up to 120 minutes and 21% use internet 120 minutes or more for educational purpose (Figure 10 and Table 11).

Table 11: Students using internet for education purpose.

Less than 20 minutes	30
20-40 minutes	47
Up to 120 minutes	42
120 minutes or more	31

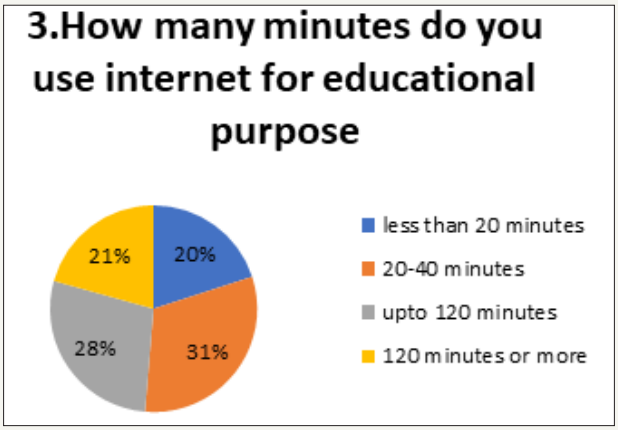

Figure 10: Students using Internet for education purpose.

The preferences level of students on blended courses over face to face courses: According to the survey conducted, following result were observed: According to the survey poll, 50 respondent (33%) agreed that blended course is better than class room courses, 25 respondent (17%) strongly agree on blended courses than classroom courses, 38(25%) respondent are neutral and 25 (17%) respondent are disagree with blended course than classroom course and finally, 12 (8%) are strongly disagree with the blended course, they think that class room course is better than blended course (Figure 11 and Table 12).

Table 12: student preferences on blended courses over face to face courses.

Strongly agree	25
Agree	50
Neutral	38
Disagree	25
Strongly disagree	12

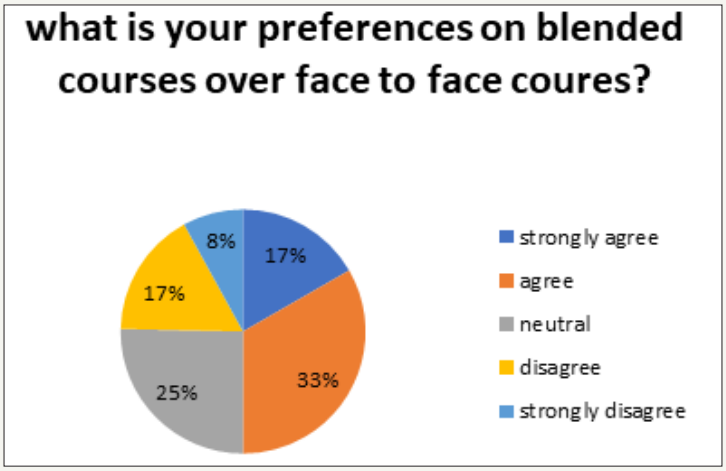

Figure 11: student preferences on blended courses over face to face courses.

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The level of preferences of student towards offline rather than online courses: According to the survey, the following results were obtained: A significant number of respondent 65(43%) disagreed on offline courses, they prefer online course is better than offline courses, only 45 (30%) student agreed on offline course and 25 (17%) are strongly agreed on offline courses, they think that offline courses is better than online courses and finally, only 15 (10%) students are strongly disagreed on offline courses, they prefer online course than that of offline course (Figure 12 and Table 13).

Table 13: Preference of student towards offline rather than online courses.

Strongly agree	25
Agree	45
Disagree	65
Strongly disagree	15

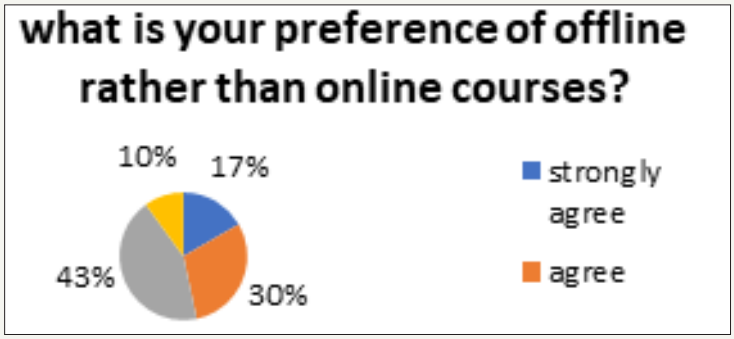

Figure 12: Preference of student towards offline rather than online courses.

The level of preferences of student over e-learning pedagogy in future: According to the survey conducted, the following results were obtained: A large number of students specifically 60 respondents are agree on online courses in future, 20 respondent (13%) are strongly agree on online courses and they want e-learning pedagogy in future, 45 respondent (30%) are disagreed on online course in future and finally, 25 respondent(17%) are strongly disagreed on online course in future (Figure 13 and Table 14).

Table 14: The preferences of student to prefer full online courses in future.

Strongly agree	20
Agree	60
Disagree	45
Strongly disagree	25

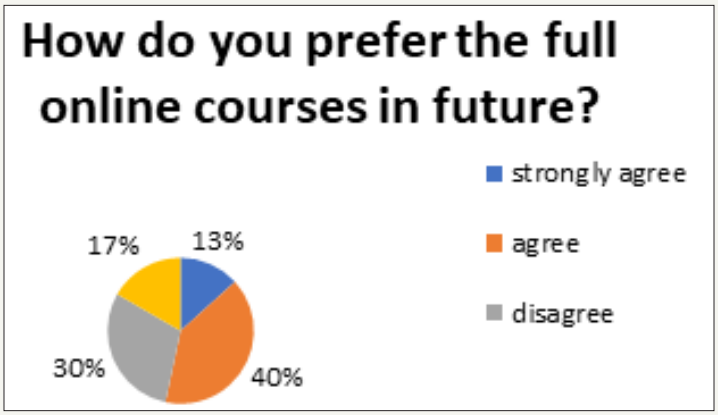

Figure 13: The preferences of student to prefer full online courses in future.

The medium of study students finds most helpful to their leaning: During research, a survey was conducted in order to explore the best study medium used in learning that helps the students to learn in best and effective way. The survey concluded the following result: According to the survey poll, 55 respondent (37%) prefer practical classes are more helpful in their learning, on 15 students (10%) thinks that lecture medium is more helpful in learning, and 38 student prefer e-learning method of study is more better in learning, and finally more 42 students(28%) thinks that blended learning method of study will more helpful in their learning than other types of learning methods (Figure 14 and Table 15).

Table 15: The study medium students find most helpful in their learning.

Lectures	15
Practical class	55
E-learning	38
Blended learning	42

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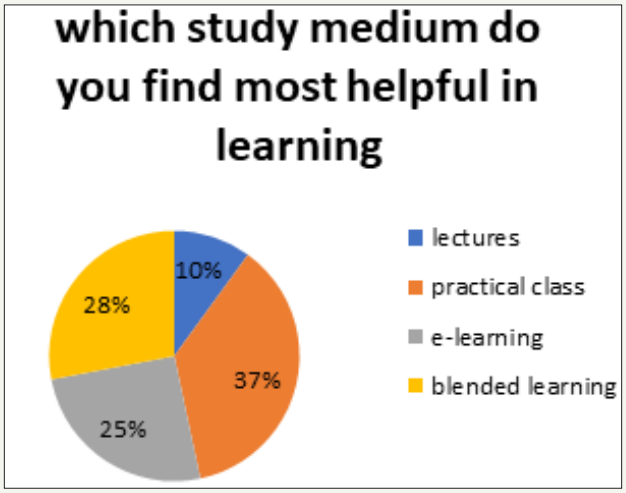

Figure 14: The study medium students find most helpful in their learning.

Some prime factors being liked by student in e-learning course: A survey has been conducted to find out some factors being liked by student in e- learning course, the result is as follows: According to the survey, 50 students(34%) like pictures and animations, 35 students(23%) like multimedia enhanced content, 44 students(29%) like explanation in e-learning and only 21 students(14%) do not like any one of these content (Figure 15 and Table 16).

Table 16: The factors that student like most in e-learning.

Multimedia enhanced content	35
Pictures and animations	50
Explanation	44
Do not like at all	21

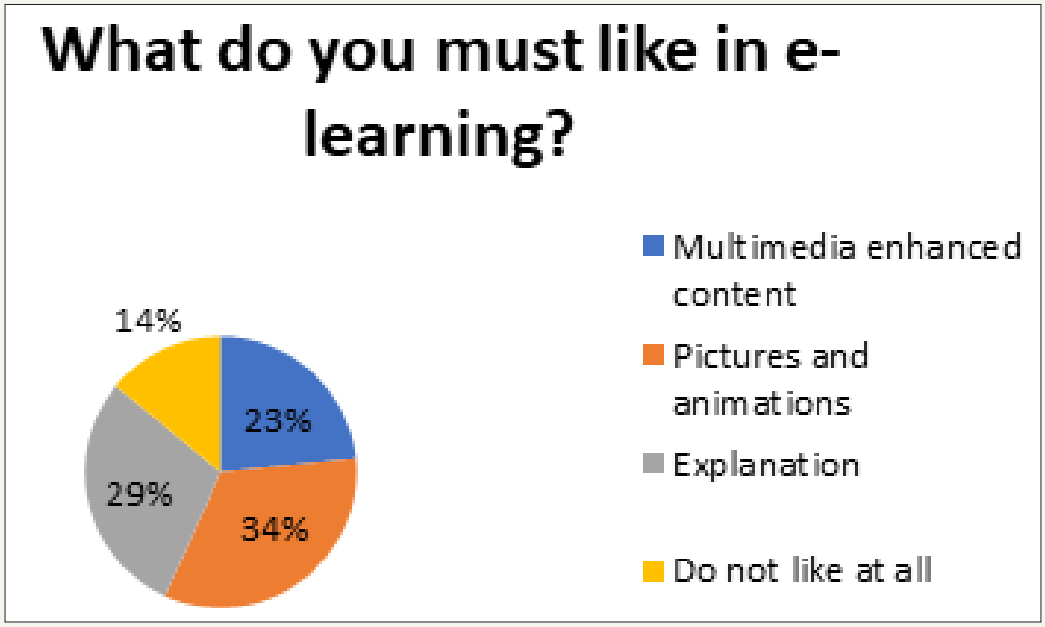

Figure 15: The factors that student like most in e-learning.

The reasons of preferring e-learning methodology over the traditional one: A survey was conducted to find out the reasons of preferring e-learning methodology over traditional one, and the result obtained is as follows: According to the survey , student prefer e-learning over traditional methodology, because 28%(42) believe in cognitive based learning, 26%(38) believe in both self-paced learning and increase learner convenience methods and only 21% (32) students believe in flexible and clear learning in e-learning methodology (Figure 16 and Table 17).

Table 17: Reasons for preferring e-learning methodology over traditional one.

Cognitive based learning	42
Self-paced learning	38
Increase learner convenience	38
Flexible and clear	32

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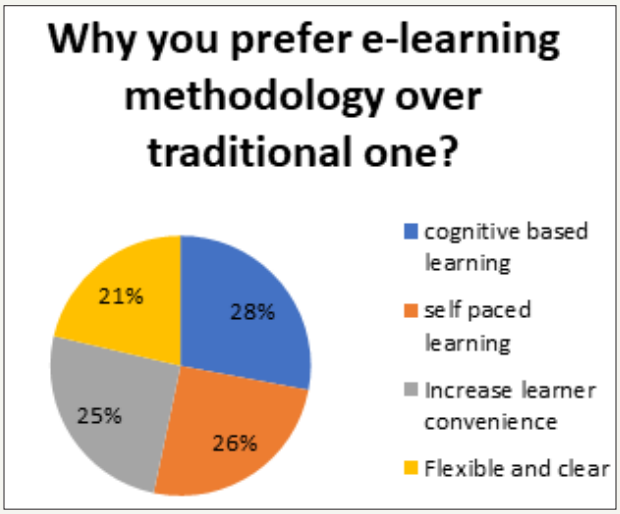

Figure 16: Reasons for preferring e-learning methodology over traditional one.

Analysis and Design Blended Model

Nepal is a land locked country which is situated in geographically hilly region where transportation infrastructure is very expensive. In the Himalaya and mountain region it is very difficult to go school; it takes 2-3 hours to go to school. Generally speaking around 89% of population of Nepal lives in villages as one of the poorest economics in Asia, there is a large difference in the standard of living between the urban areas and the rest of the country. Undoubtedly there is a major contributor to the fact that only 2% of the total population receives higher education.

In this study, the researcher has analyzed the present teaching-learning pedagogy that exists in Nepalese education system. It has been observed that Nepal government and other private institution have been investing a huge amount of money in education sector, but the outcome doesn't seem to be satisfactory in terms of quality, productivity and academic standards. The main reason behind these unsatisfactory academic outcomes has been found due to the traditional and teacher centric teaching pedagogy which restrict the students to explore them in a productive way.

Situation analysis of education in secondary schools of Nepal

The world is not as static as it used to be ten years ago. Things and concept are coming up and going down at rapid rate. The syllabus that was made ten years ago is now almost outdated. Therefore, our course needs to embrace the change environment and the better ways of learning methodology develop every day. Class learning will focus on learning concept that will not change in near future and e-learning on concept that is dynamic in nature say for example computer and mobile technology.

During the research, it has been observed that "Chalk and Talk" based traditional and teacher centric methodologies are still dominating the Nepalese education which is still highly recommended by most of the stakeholders of Nepalese schools. In this teaching approach, learning objectives are often undermined and the teacher's way of understanding the learning material is presented the way the teacher has understood. Often the key concept that the teacher has felt important and his derivation and understanding are more highlighted. The traditional and even present rigid education system in Nepal still believes that a teacher after attaining certain academic levels has understood how student should be prepared for their future by reading the objectives of the lessons found in the prologue of each chapter in a textbook.

Blended learning, a positive jumpstart in Nepalese education

To overcome the aforesaid problems in learning system of Nepalese context, researcher proposes ICT based learning approach which offers powerful and effective tool to deliver the education to the students.

It is the model that combines the traditional approach of pedagogy with the modern learning. Basically, manifests the classroom as well as anywhere learning scheme. Certain credits of learning are acquainted by the help of teachers face to face physically present in a room. The learning materials such as blackboard\whiteboard, chalk and listening and note making are done on the spot. Teachers do ask questions and take exams and verify the objectives of learning in the classroom. Group of the students can interact with each other and know that they all have come to learn in the classroom for their better future. Such traditional pedagogical methodology is combined with e-learning where there is no teacher and only the student desire to learn aids himself/herself for understanding the concept. Besides, the multimedia rich contents also help the pupils to grasp the concept clearly. Student can learn anytime, anywhere and any place. Even the old lectures can be retrieved, and assignment submitted to the teachers online. This saves time, money and other resources.

Due to traditional learning methods still popular, total e-learning cannot be put directly though there are some distance learning university/ college that admit student online. However, such ambitious scheme of total e-learning will not be productive in context to Nepal because the use of ICT in education is still in infant stage. Hence, blended model of learning can be positive jumpstart in Nepalese context. The result of conducted research over different

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school of Achham has also shown very positive responses of students and school administration towards ICT based blended learning. Such solution to better learning for new generation children will definitely be productive and will prepare them for the new generation to face the new challenges.

Cost benefit analysis

Initial cost is high: Developing any new system without cost is like a dream. Therefore, e-learning portal development and its implementation in hardware and software cost a lot in addition to repair and maintenance in the country like Nepal where fundamental necessity factors such as power and energy is punctuated. Besides, there need to be high skill manpower to develop and train e-learning courses.

Lower delivery cost: Putting aside the initial cost of installation and setup, blended learning system will definitely have advantage and cut cost nearly the half in most of the case owning to the fact that digital delivery is easier, cheaper and faster to update. It's long been proven that e-learning leads to lower delivery costs. Online delivery result in lower printing and distribution costs. Besides, the lower cost is also due to a reduction in training time; e-learning can deliver significant benefits by reducing the time it takes to train people.

Economic benefits of e-learning: The potential economic benefits of proposed e-learning system can be classified into two categories:

1) E-learning improving general education, which in turn has economic benefits, and

2) E-learning creating a technology-immersed population with 21st century job skills, which in turn create economic returns for a country investing in e-learning.

It must be noted that although e-learning can enhance economic outcomes through multiple mechanics, it is difficult to measure the benefits. First, there is significant time lag between the learning process and its effects on the on the student's employment or the society at large. Panel data following individual student over a long-time frame is nearly impossible to find. The second difficulty is measuring the impact of the diversity of learning goals and outcomes. Workforce development is a one such goal, but other initiatives may focus on health, good citizenship, or the arts. Third, e-learning in only one component where technology and learning meet; e-learning as such is a relatively recent phenomenon yet a technology savvy workforce has been a foundation of many developed economies for several years. It is difficult to disentangle informal learning about and through technology from traditional and formal e-learning processes.

Designing a network frame for E-learning model: In order to get high bandwidth and thus quick access to e-learning materials in the school end, Intranet lease line subscribed from the NTC (Nepal Telecommunication Corporation) can be approached as the medium. The NTC has its ADSL (Asynchronous Dial Up Subscriber Link) services accessible to75 district as shown in the diagram below (core router level). As the e-learning is hosted in Achham, therefore all the schools are connected to the server Dhangadhi via lease intranet line (Figure 17).

Figure 17: Wimax coverage area of NTC all over Nepal.

Limitation of research/study: Although this research was carefully prepared, it still has limitation and shortcomings.

1. The study was conducted only to limited areas such as school and student of only Sodsha devi School of Ascham.

2. The sample population on which the survey was carried out was only 150 respondents.

3. The larger number of respondents and area could not be considered due to financial constraints.

Conclusion and Recommendation

Conclusion

E-learning is the need of the present and future especially in developing countries like Nepal. It is efficient, time saving and cost effective in the long run. Implementing e-learning in the blended model is the necessary measures in places where transportation is poor. While exploring the secondary schools of remote area of far western region, it was found that few schools had computer class

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starting from grade five mainly in theory class. The computers were mainly donated and very few. The computers were not smoothly used due to different technical barriers. Majority of schools had no computer science subject and were quite oblivion to computer and the technology. It is also concluded from the research that the most limiting factor in implementing e-learning includes cost of infrastructure setup, connection, training people etc besides load shedding and internet availability and bandwidth problem. In response to the second objective of analyzing the responses of the student and the secondary schools on various mode of learning, it was found that education manifested with ICT was the most popular mode of e-learning to the students. During the research, the school of Achham such as Sodsha devi higher secondary school have used interactive white board or have introduced DVD based offline training or have started computer science subject with practical.

The researcher has observed it as a small step towards the path of blended e-learning approach. The researcher also is firmly of the opinion of first honing the IT skills in the educational pedagogy so that the ICT becomes a boon when it is understood and is leverage in narrowing the digital divide that is growing too fast inside and outside the country. The government is also aware of the revolution of e-learning in Nepal but it is unable to play any substantial role in leveraging the use of ICT in education all over the country. However, Ministry of Education (MOE) along with the open learning Exchange Nepal (OLEN) – a nonprofit US organization based in Kathmandu have so far distributed more than two thousand children in 26 school across 6 district affordable educational tools called XO laptops with internet access in its first pilot phase in the year 2008. On the other hand, it is high time that the government should stop banking on international Non-government organization (INGO) for the distribution of educational tools such as laptop.

Finally, a proposed e-learning model is presented that will be hosted in the Nepal using ADSL Internet/intranet infrastructure laid by NTC.

Recommendation

The following recommendation is made in the interest of adopting e-learning in the secondary schools of rural areas of far-western region as well as throughout the nation.

a. Nepal government should take necessary steps to develop proper ICT infrastructure required for e-learning.

b. Nepal government should formulate new policies and amend the policies that are curbing the growth of ICT.

c. There should be provision of free access of internet and computer in rural areas so that they can benefit from e-learning thus bridging the digital divide in rural and urban areas. Hotspots and other wireless facilities to access internet should be implemented by the government.

d. Investment in the underground fiber optical cables to tap the global internet super highway to deploy nationwide backbone of ICT infrastructure built on high speed fiber cables must be initiated by the stakeholders of innovative technology.

e. Educational e-learning workshops and awareness program and campaigns should be organized from the government, public and private sectors.

f. The government should provide subsidized funds to those schools who implement e-learning in their schools.

Additionally, the management/ school committee develop a motivational reward system to those teachers who blend e-learning with face to face teaching in their course. It is also possible to acquaint IT skill to the parents/guardians of the students.

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