



International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 4, April 2018

Opportunities and Challenges to Use ICT in Government School Education of Nepal

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ABSTRACT: Information and Communication Technology (ICT) plays strenuous role to make teaching and learning activities more meaningful. It is one of the most efficient tools for advancing knowledge and skills. It is necessary for quality education in government schools in Nepal. This study reviews the concepts and roles of information communication technology in government school education of Nepal. It highlights the challenges facing in use of ICT in government school education of Nepal. It identifies how ICT can be used to enhance quality education of government schools in Nepal. Problems such as lack of resources (viz. qualified teachers, hardware, software, electricity etc.) and poor project implementation strategies militate against these efforts. This study recommends that both government and non-government organizations should help to facilitate skilled manpower, stabilized electricity supply, hardware resources and software resources to enhance the use of ICT in government schools.

KEYWORDS: ICT; Education; Teaching; Learning; Government; Schools; Nepal.

I. INTRODUCTION

ICT in Education means teaching and learning by the use of ICT. Information and communication technologies (ICTs) are currently being used in education to assist students to learn more effectively by providing teachers with access to a wide range of new pedagogy. These technologies are also being used to enable teachers to do administrative tasks more efficiently [1]. Information and communication technology (ICT) can complement, enrich and transform education for the better.

ICT in education has multiplier effect throughout education system, by enhancing learning and providing students with new set of skills; by reaching students with poor or no access (especially those in rural and remote regions); by facilitating and improving the training of teachers; and by minimizing costs associated with traditional instruction(UNESCO,2014). Yusuf (2007) described ICT as an electronic technology used for accessing, processing, gathering, manipulating, presenting and communicating information. He emphasized that when ICTs are employed in education, they can accelerate, enrich and deepen basic skills in reading, writing, arithmetic and the sciences beside motivating and encouraging students to learn as they become more independent and responsible for their learning. Information communication technology is a tool (Nwakundo, Oguejiofor and Nwankwo, 2006) that comprises electronic devices which are utilized for the information and communication needs of institutions, organizations, students and individuals. Such electronic devices include computers (software and hardware), networking, telephone, video, multimedia and internet. Application and utilization of these devices convert information, text messages, sounds and motion to common digital forms.

Therefore, information and communication technology in education is the use of all forms of technology assisted programs, popularly known as TAI (Television Assisted Instruction), RAI (Radio Assisted Instruction), CAI (Computer Assisted Instruction), Mobile Learning and IAI (Internet Assisted Instruction).

II. RELATED WORK

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



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Department of Education Bhaktapur, Nepal, this paper aims at finding out the opportunities and challenges to use ICT in government school education of Nepal.

Nepal has developed and implemented numbers of policy and programs provision that heavily emphasis on ICT on education, like National IT policy (2010, 2015), 10th plan (2002-2007), Three Years Interim Plan (TYIP, 2007-2010, 2010-2013), School Sector Reform Plan (SSRP, 2009-2015). The implementation of the Information and Communication Technology in Education Master Plan (2013-2017) has increased access to computers and the internet in schools, which allows for the scaling-up of the use of ICT in school education. The recent national educational plan is School Sector Development Plan, SSDP (2016-2023). Following these policy and program provisions, MOE/DOE is implementing the policy of supporting four computers and one printers to L/Secondary school under matching fund of NRS 200,000 (school's share 40,000). To the date, there are numbers of L/Secondary schools benefited from this ICT Support program. Use of Information and Communication Technologies (ICT) in education has been considered as one of the strategies to achieve the broader goals of education. The Government of Nepal, Ministry of Education, through National Curriculum Framework (NCF), has introduced ICT as a subject as well as ICT as a tool for instruction in school education. Computer in Nepal came into existence only in 1972 for utilization of it in public census on rent, monthly NPR 1, 25,000 which was installed in Electronic Data Processing Centre under Central Bureau of Statistics and this Bureau was, turned into National Computer Centre (NCC) in 1975 in autonomous capacity, which collapsed right after establishment of ministry of science and technology. In education, computer was first utilized for publication of SLC results in 1981 in collaboration with National Computer Centre and continued until in-house computer system was established in Office of Controller's Examination in 1998. However, these efforts were only using ICT for smooth office operation rather than use of ICT for pedagogical purposes. Right after restoration of multiparty democracy system in the country, new curriculum 1992 was implemented, this provisioned the access to those who were willing to learn computer science as a subject from the list of optional subjects, to be started in grade 9 and to be terminated in SLC examination. The provision of studying computer science as subject from elective area still exist in school curriculum and first SLC graduates with computer science appeared from SLC examination of 1995 and onwards. However, the efforts for integrating ICT in teacher preparation and professional development programs seems to be not encouraging that limits up to trainer develop programs with provision of multi-media labs in training centre under National Centre for Educational Development (NCED) system of Ministry of Education (MOE). However, government programs for supporting computers provisions for school got low priority until implementation of EFA program (1999- 2004). But DOE developed the programs for support of school computer with the provision of matching fund of NRS 100,000 with 40% school share and 60% government share during implementation of EFA II (2004-2009). Now, at the moment in the implementation process of SSRP, 2009 onwards up to now government has committed to support school computer program with a matching fund of NRS 200,000 per school if they claim that they have computer infrastructure and government provides 80% of committed sum as their share and provide computer training to teachers. One Laptop Per Child (OLPC) was another government's effort in utilizing ICT in school education in 2007. OLPC was pilot program in 26 primary schools of 6 districts, implemented in collaboration with Open Learning Organization (OLE), an NGO in Nepal. This OLPC program could not 20 satisfy clientele needs and government did not expand it in national scale. However, innovative works done by OLE are considered to be e-library. Presently, Government has made ICT program provision in supporting those schools who claim they have computer infrastructure through matching grant of NRS 200,000, of which school share is to be NRS 40,000, for buying 4 computers and one printer. Computer as a medium of instruction is being utilized in the form of multimedia classroom (a projector, screen or large LCD, speaker and a classroom computer), computer lab (single seat or multiple seat) and single station having personal computer (PC, microcomputer, laptop or notebook, and small personnel devices such as tablets, smart/mobile phone, and e-readers) in one-to-many and one-to-one approach. [2]

III. APPLICATION OF ICT IN EDUCATION [3]

A long-term goal of education in Nepal is to provide citizens with the knowledge and skills they need to work for the development of the country and to integrate Nepal into the global community. To achieve this goal, the Government of Nepal is working to ensure access to quality



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basic education for all and to develop work and job market relevant education. With the expanding role of information and communication technology (ICT) in all areas of life, MoE (Ministry of Education) considers the use of and knowledge of ICT essential. MoE therefore aims to provide students with ICT skills and use ICT as an important tool to:

- improve classroom delivery;
- increase access to learning materials; and
- improve the effectiveness and efficiency of educational governance and management.

MoE has introduced ICT into the school sector by establishing computer labs in selected schools and internet connectivity in DEOs and schools. Furthermore, central level agencies, regional education directorates and all 75 DEOs have launched websites and the DoE has developed interactive digital learning materials for students in grades 2 to 6 in Nepali, Maths, English and science. However, the ICT equipment in schools is mostly being used for administrative purposes. This highlights the need for strengthening institutional capacity, skills and the awareness of teachers and education managers to maximize the impact of introducing ICT in education. It is crucial to ensure that ICT is used in relevant and appropriate ways and that an ICT enabling environment is established with the institutional and professional capacity to maintain, update and use applications and features, as well as that educational facilities support the use of ICT in terms of power supplies, internet connectivity and other necessities.

IV. OPPORTUNITIES TO USE ICT IN GOVERNMENT SCHOOL EDUCATION OF NEPAL

2.1 Policies on ICT in Education

Education has been considered as a fundamental right of the people by the Interim Constitution of Nepal 2007. Nepal has developed and implemented numbers of policies and programs provision that heavily emphasis on ICT on education, like National IT policy (2010, 2015), 10th plan (2002-2007), Three Years Interim Plan (TYIP, 2007-2010, 2010-2013), School Sector Reform Plan (SSRP, 2009-2015). The Government of Nepal (GON), Ministry of Education (MOE) has introduced various interventions in order to achieve the goal of education in Nepal. Use of Information and Communication Technologies (ICT) in education has been considered as one of the strategies to achieve the broader goals of education. The Government of Nepal, Ministry of Education, through National Curriculum Framework (NCF), has introduced ICT as a subject as well as ICT as a tool for instruction in school education. [4]

The implementation of the Information and Communication Technology in Education Master Plan (2013-2017) has increased access to computers and the internet in schools, which allows for the scaling-up of the use of ICT in school education.

The recent national educational plan is School Sector Development Plan, SSDP (2016–2023).

The ICT objectives of School Sector Development Plan (2016–2023) are as follows [5]:

- The appropriate use of ICT to improve classroom delivery by establishing an ICT enabling learning environment (including institutional and professional capacity of managers and implementers) and based on need and context.
- Appropriate development access to learning materials and supporting professional development packages and guidelines to ensure adequate capacity for incorporating these in the curriculum.
- The use of ICT for the improvement and increased effectiveness and efficiency of overall educational governance and management.

SSDP's strategies for improving knowledge of and the use of ICT are as follows [6]:

- a) Establish an ICT enabling learning environment by including ICT prerequisites as enabling conditions in government schools and the provision of ICT infrastructure and teaching-learning materials for pedagogy.
- b) Establish ICT learning centers in schools with enhanced teaching-learning processes.
- c) Incorporate ICT in the government curriculum through the development of professional development packages and guidelines.
- d) Develop need based educational materials for children with visual and hearing impairment and support computer education in government deaf schools.
- e) Develop portals and websites including e-libraries.



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- f) Train teachers on the use of ICT in teaching and learning.
- g) Develop online and offline training courses and materials (focusing on science, maths and English).
- h) Prepare ICT teaching and learning materials, initially for science, maths and English.
- i) Develop and distribute subject-wise e-learning resources for students and teachers and establish a repository of them.
- j) Strengthen school governance and management through a strengthened EMIS (Educational Management Information System), including the enhanced use of ICT to improve the EMIS and implement a unified accounting software, the Computerized Government Accounting System (CGAS) in MoE.

Table 4.1: SSDP's ICT outcomes, results and major interventions

Outcomes	Results	Major interventions
Appropriate application of ICT in education	Strengthened ICT infrastructure	<ul style="list-style-type: none"> ● Provide ICT teaching-learning materials to strengthen teaching interactive approaches. ● Establish ICT learning centers in model schools. ● Prepare ICT teaching and learning materials initially for science, maths and English. ● Provide ICT infrastructure and teaching-learning materials. ● Implement unified accounting software (CGAS) in MoE's system. ● Introduce school based integrated EMIS, including an Equity index, school profiles and unique student IDs.
	ICT enabled teaching-learning for science, maths and English implemented	
	Strengthened EMIS, including by enhanced use of ICT in it.	

Source: School Sector Development Plan (2016–2023)

The table above summarizes the SSDP's ICT outcomes, results and major interventions. Currently it focuses on ICT enabled teaching-learning for science, maths and English subjects. Similarly, it also focuses on implementation of school based integrated EMIS (Educational Management Information System), Computerized Government Accounting System (CGAS)-a unified accounting software in all government schools of Nepal. This shows the effort of government in integration of ICT in government school education of Nepal.

2.2 Some ICT Projects Launched

The following ICT-projects are launched in schools in our country with the non-governmental initiatives.

- Open Learning Exchange (OLE-Nepal)
- OLPC (One Laptop Per Child)
- Nepal Wireless Networking Project (NWNP)
- HRO Nepal
- Information Technology Society Nepal (ITSN)
- And many more.

V. CHALLENGES TO USE ICT IN GOVERNMENT SCHOOL EDUCATION OF NEPAL

The development of information and communication technology in government education is faced with many challenges. So far, ICTs have not been used as a way of acquiring new knowledge and skills in schools of Nepal due to inadequacy of curriculum content and limited access to ICTs. Other challenges include inadequate funding, lack of basic infrastructure, lack of qualified personnel and lack of policy formulation and implementation.

The major challenge in our context is the required physical infrastructure for implementing ICT. Nepal still experiences a lag in its implementation. This continues to widen the digital divide and the access to ICT facilities as a major challenge facing in Nepal. The following are challenges facing in implementation of ICT in government schools of Nepal:



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1. Lack of Qualified Teachers to Teach ICT in Schools

The demand for ICT learning has been stupendous and the number of teachers who are trained to teach ICT cannot meet the demand. There are more students willing to be taught computing skills than there are teachers to transfer the skills [7].

2. Lack of Electricity

Many schools are still not yet connected to electricity; Nepal being a developing country, the government has not been able to connect all parts of the country to the national electricity grid. Inevitably, those schools that fall under such areas are left handicapped and may not be able to offer computer studies [8].

3. Policy related

Still the MOE has not come up clear policies the implementation of ICT in classrooms. The macro policy is there but it is equally important to transform them into micro policies so that each school will get an opportunity to have ICT facilities for their children.

4. Lack of Computers (Hardware and Software Resources)

Computers are still very expensive. Most of the schools don't have basic ICT resources such as computers, computer software and additional hardware resources. Though lots of efforts are made by the government agencies, individuals, corporate organizations, NGOs to donate computers to as many schools as possible.

5. Financial

Despite of the government commitments at various national and international forums to allocate 20% of the national budget and 4-6% of the GDP amount in education sector, the percentage of education budget is in decreasing trend from past several years. In the current fiscal year of 2017/18, out of the total national budget only 9.91 percent (about NRs 126 billion) is allocated for the education sector. This declination in education budget shows that the state does not hold education as a matter of priority [9]. At a time when minimum enabling conditions do not exist in schools, it will be very difficult to introduce ICT on government expenses.

6. Curricula related

Although Nepal has a system of continuous improvement in curriculum it cannot do so frequently because of the distribution of free textbooks in schools. So it should wait for at least 5 years in changing the curricula. The ICT will be coming in new shape every year but our curricula will be out of date by the time we install them based on existing efforts.

7. Sustainability

Twenty-two percent of the total education budget comes from multi-donor agencies. This is the only money the government has for development purposes. The danger is that the development projects will not continue after the projects are over. Thus the initiation of the government for ICT integration in education will follow the same suit.

VI. CONCLUSION

In Nepal, the initiation for ICT in school education is progressing. The implementation of the Information and Communication Technology in Education Master Plan (2013-2017) has increased access to computers and the internet in schools, which allows for the scaling-up of the use of ICT in school education. The recent national educational plan School Sector Development Plan (2016-2023) integrates and focuses on use of ICT in government schools. This demonstrates the commitment on the part of the government. Until now, the program is not in a stable position. The roadmap has been clear but the travel still takes a long time.

VII. RECOMMENDATIONS

The following recommendations are made to promote and improve the development of ICT education in government school education of Nepal.

- Teachers in government schools should be provided with requisite and appropriate skills in ICT so that they will be able to impart the skills to the students.
- Policy makers should make certain that ICT policy statements are practical and easily convertible into reality.
- The level of literacy in ICT should be enhanced by creating awareness through the media and by developing positive attitude towards the application of ICT in government schools.



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- The government schools should be provided with necessary funds for proper financing and maintenance of ICT related appliances.
- ICT operations require constant electricity for its maximum use. Therefore, power supply should be massively increased, improved and worked upon so as to enhance the use of ICT in government schools.
- The government should make the teaching of ICT a free and compulsory part of the curriculum to massively increase the number of ICT experts in the nation.
- Both government and non-government organizations should help to facilitate skilled manpower, stabilized electricity supply, hardware resources and software resources to enhance the use of ICT in government schools.

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