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A Brief History of Public Education, Information & Communication Technology (ICT) and ICT in Public Education in Nepal

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Abstract: Nepal's public education has a somewhat dubious history. Over the course of more than a century it has seen a rapid growth playing an instrumental role in bringing about changes in the sociopolitical arena. However, its qualitative aspect has always been questioned while its quantitative aspect has been somewhat appreciated. In order to enhance the quality of education, especially in the last two decades, ICT, Information and Communication Technology, has been looked into as one of the potential elements in bringing about much needed qualitative improvement in Nepal's education system. As a result, attempts have been made to make use of ICT in its public education system from both government and non-governmental agencies. This paper tries to understand historical development of ICT, public education system and attempts being made to integrate ICT in public education.

Keywords: ICT, Public education in Nepal, ICT in public education in Nepal, ICT in education

1. Background of Study

With the advent of Information and Communication Technology, ICT, combined with easy accessibility, thanks to falling prices of devices used and the price of internet subscriptions—globally and locally—ICT has now become mainstream. The Internet and its use via personal computers, smartphones and other devices have become commonplace. The computers now are no more static, standalone devices but have become personal devices that play a decisive role on the way we do things. For a country like Nepal, which has seen the use of this technology 'grow' rapidly in the last decade and half, its use can really make a telling difference to all aspects of its organizational

structure—from the way we manage health to education.

This study is an attempt to understand how ICT has impacted one particular domain of our governance, or daily lives—education. Use of computers in classrooms for teaching and learning purpose has now gained global acceptability. Schools around the world are no more using computers, or ICT, as replacement for day to day administrative work, but have managed to integrate it into core classroom teaching thus bringing in a paradigm shift from the way teachers once used to be—from 'a sage on stage' to 'a guide by the side'. The teaching and learning process has taken a leap from instructivist approach to a constructivist approach. Constructivism argues that there is nothing systematic about how we learn or construct knowledge. Rather, constructivists believe that knowledge is constructed socially using language [39] and everyone has different social experiences resulting in multiple realities. On the other hand, instructivism (sometimes also referred to as objectivism or the systems view) argues that using an instructional systems design model can be useful to instructional designers to systematically identify what is to be taught, determine how it will be taught, and evaluate the instruction to determine if it is effective [16].

Education has always been a key priority in all government plans. With the ousting of the Rana regime in 1950, all governments in Nepal have been put a lot of emphasis in uplifting education in the country. In 1952, the Ministry of Education was established for the development of education in the country, mainly school education. The portion of Gross Domestic Product, GDP, allocated to improvements in education has been on the rise. Alongside, ICT has emerged as a priority area. This is evident from the fact that the Government of Nepal developed a formal ICT policy in 2010. Interestingly, IT policy made a minor attempt to integrate technology into education primarily by increasing its accessibility. However it was ICT in Education Master Plan 2013-2017 that first made any serious attempt to make use of ICT for teaching and learning in public schools in Nepal.

However, one must recognize the fact that mere presence of technology does not suffice and therefore does not guarantee its successful use, or the opposite. It's how well is technology 'integrated' determines its success. Research in several developing countries like ours has shown that when it comes to technology integration in teaching and learning, infrastructure alone does not suffice. Studies have shown that it does not take more than three to six months from setting up a computer lab for these machines to stop functioning. As a result, the number of broken computers within most of the schools is always very high and more than often surpasses the number of functioning computers. And even when

computers are functioning, very few are underused or left completely unused.

Why do such things happen? Why is that while community members, school administrators, teachers and students always have a deep admiration for the use of technology and therefore go out of the way to install IC technology by setting up computer labs on one hand, but fail to make proper use when once installed?

The aim of this study is therefore to dig for the reasons for the impediments to the successful use of IC technology in public schools in Nepal. The rationale for this study is evident from the fact that in partnership with the government, various national and international and non-government organizations have been spending millions of rupees every year without making a meaningful attempt to measure its return on investment.

2. A Brief History of Education in Nepal

2.1. Education - In the Rana Regime 1846 - 1950

The whole idea of education under the Rana Regime hinged on the idea of education as a foreign, and modern, import from the outside world. The idea was therefore to "both limit the dangers inherent in foreignness and at the same time harness its powers". [18] Formal tutor led instruction for the children of Rana elite was initiated in October 1853 by Jung Bahadur Rana, with classes held within his palace[5]. His successors gradually extended this provision to encompass non-Rana children of high status, aided by the relocation of the expanded 'Durbar School' to its current site in central Kathmandu. In 1902 the sons of the aristocratic regime were sent to Japan to receive a grounding in technical education to temper "the progress of liberal and popular education"[3]. However, the regime soon realized the dangers of sending people abroad as they would return back gaining not just the 'targeted knowledge' but also that of liberty and freedom. Fixated with the notion of the Hindu state and crevices that might crop within, it has been reported that when a request was made to the ruling elite to send students to Europe or America, the advisory council to the Prime Minister "advised against this scheme and suggested that it would be better to invite the help of Indian experts" [17]. The Ranas basically aped the approach of the British in India as is evident from language policy adopted with a strong emphasis on English, something the rulers of princely estates in India were busy doing.

It's been reported that under Dev Sumsher Rana's brief four-month reign in 1901, 300 Nepali medium schools were opened to all children. Many saw this as a threat to the regime. Schools were closed down soon after Dev Sumsher's reign was over [5]. In 1934, Nepali was acknowledged as the formal language. The reason was not so much to recognize the language as such but learning made from the increased nationalist activity against the Britishers in India and therefore was an attempt to distance itself [19]. The post World War II period was of considerable unease to the regime as servicemen began to return. They not only started talking about alternate ways of life, but also started conducting informal literacy classes to pass on the skills they had acquired.

2.2. Post Rana Regime

The whole theme of the post-Rana regime was based on the "idea of reconstruction of Nepal". According to Caddell [5], "Legitimacy came in the form of opening up to the outside as in exchange of culture and ideas." The new education policy was "sold" as a jump from "stagnation to path of change". The five year plan for education mentioned the system during Rana Regime saying that "the encrustation of the rusts of centuries of ritualism have made the conservative minds least receptive and responsive to science"[20]. 'Vikas', or development, was mentioned as an idiom through which the relationship between local communities and the outside world is expressed. The schools were promoted as a symbol of modernity and that would create a new identity for the nation. A nationalist whim was created. The underlying theme was that of "unity" and hence use of Nepali as the basic language was encouraged to the younger population. The expected outcome was that other languages will disappear resulting in a strong sense of nationalism[29]. From Grade VI onward, languages other than Nepali were accepted. From Grade I to Grade V, Nepali was made compulsory. The United States Operations Mission, USOM, later renamed the United States Agency for International Aid, USAID, had a significant role in devising the National Education Planning Commission, NEPC, and all major policy documents due to their funding and technical assistance. Our policy became directly affected by the policy of the US that gave prominence to English as official medium.

2.3. December 1960

In December of 1960, King Mahendra, who had until then run the government as a ceremonial monarch along with his political ally Nepali Congress, which had played an instrumental role in overthrowing the Rana Regime, took absolute power on the grounds that congress

had totally put party above the national interest. The motto of the Panchayat System of Governance for fostering education became that of "Ek bhasa, ek bhes, ek desh"; that is, "One language, one attire, one country". The focus was back on Nepali and the entire idea of diversity was curtailed. The blueprint of modern national education policy was drafted by Sardar Rudra Raj Pandey, who chaired the commission along with Kaiser Bahadur KC and Hugh B Wood in 1956. Dr Wood, who was an education specialist from the University of Oregon and was on a Fulbright Teaching Assignment in India, was specially invited by the then king to help set up the National Education Planning Commission[35]. Hailed as one of the most politically significant documents ever drafted in Nepal, the Nepal Education System Plan of 1971 was seen as "Nepal's declaration of independence from US policy dominance" [36]. NESP became the torch bearer for a new education system built on the foundation of national unity and assimilation of individuals into the mold of the nation-state with the Panchayat model of government at its heart [5].

As the thrust on "singularity" over "plurality" became the norm, downplaying the value of other mother tongues and focusing on Nepali as the singular language of instruction, left room for dissenters. Nonetheless, it was the first plan of its kind that focused on giving 'skill-based' education to fulfill the manpower need of the country. This was to be achieved via the introduction of several vocational subjects like cooking and typing. A key problem with the NSEP initiative was apparent though. Despite the well-laid plans to increase the vocational element of instruction, without equipment or trained teachers, it was impossible to implement the plan successfully. One research showed that students been awarded points for typing courses while kitchen equipment was kept locked and unused despite it having been brought explicitly so that school could provide training on catering[5]. The idea to fulfill the lack of trained resources was conceived by the way of NDS, National Development Service. NDS mandated that all students going for higher studies in universities must go to rural or remote area and work or teach to fulfill their degree requirement. The service duration was that of ten months [44].

Although the intentions were good, people really did not like the idea of leaving a city life and going to remote places just to ensure their degree requirements were fulfilled. Discontent was simmering within. In 1975, NDS volunteers started a strike demanding better pay. As the unrest grew, and with it the possibility that the presence of students in rural areas would lead to the spread of dissent, the program was quietly abandoned.

Throughout the 1980s, schools began serving as "hot beds" of protests against the monarch which was to become a ceremonial position again in 1990. The progress made during this period is depicted in the table below.

Table 1: Education Development

Education Level	**No. of Schools**			**No. of Students**			**No. of Teachers**		
	1951	**1961**	**1970**	**1951**	**1961**	**1970**	**1951**	**1961**	**1970**
Primary	321	4,001	7,256	8,505	132,533	449,141	N.A.	N.A.	18,250
Secondary	11	156	1,065	1,680	21,115	102,704	N.A.	N.A.	5,407
Higher	2	33	49	250	5,143	17,200	N.A	N.A	1,070

Table 2: Student Enrolment

Year	**Primary**	**Secondary**	**Higher**
	Percentage of Primary School age children	Percentage in terms of Primary enrolment	Percentage in terms of Secondary enrolment
1951	0.9	19.0	20.5
1961	15.8	12.0	24.4
1970	32.0	23.0	16.0

The old school structure was revised too.

Table 3: Old Educational Structure

Primary					Middle			High	
1	2	3	4	5	6	7	8	9	10

Table 4: New Educational Structure

Primary			Lower Secondary				Secondary		
1	2	3	1	2	3	4	8	9	10

2.4. Post 1990

The education system after the introduction of multi-party democracy saw the "re-emergence of multi-ethnic, multi-lingual, democratic, indivisible, sovereign, Hindu and

constitutional monarch". Education policy formulation went into the hands of donor agencies, mostly due to the lack of funds but also with the goal of gaining international legitimacy. The idea of education was to have a greater focus on the basic and primary levels of education and the reaffirmation of the commitment to universal primary education. Education was seen as having a key role to play in bringing about social changes, and in the reconstruction of the nation as a whole. The new constitution affirmed that the "state will follow a policy of maintaining national unity in the midst of the cultural diversity, literature, script, art and culture in healthy, happy harmony with all other religions, ethnic groups, communities and languages" [28].

As a result of which, in 1992, the multi-donor-financed Basic and Primary Education Project (BPEP) was launched by the Ministry of Education. Soon, international donor agencies like UNICEF, IUCN, and UNFPA became deeply involved in the development of curriculum. All such development agencies found a way to carry their own developmental agenda into the courses and text books.

"However it was not until 1994, that the government first designed and implemented a course in named Computer Science. It was introduced as an optional course for grade nine and ten and first batch of students to sit for Computer science course was in 1995. There still was no official subject as such called computers and few teachers who had learned the technique of using them from their experience abroad were transferring that knowledge to both students and teachers alike. The actually policy in the shape of ICT in Education Master Plan came in much later, 2013. The National center for curriculum development, Ministry of Education designed and completed the course curriculum in 2013 for Grade VI-VIII. It is designed as an elective course with continuous assessment as a grading mechanism with 50% of marks allocated for theory and 50% for practical." [9]

In 2000, a separate unit called the Department of Education was established. [12] Education policies became increasingly tied to the agendas of international donors as the government sought financial support and both internal and external legitimacy. As a result of which the US model of education system gave away to new models. This is evident from the structure of the schools: 1-8 basic level education, 9-10 Secondary Level, 11-12 higher secondary level. Nepal joined the World Education Conference held in Justine Thailand & the 2000 World Education Forum in Dakar, Senegal to become a part of larger global community of set standards and objectives.

The organizational structure of the public schools became

- Ministry of Education

- Department of Education
- CDC / NCED / Non Formal Education Sector
- Regional Education Directorate
- District Education Office
- Resource Centers
- Village Education Committees
- School Management Committees
- Parents Teachers Association & Local Intellectuals
- School

The progress made on the early decades of 2000s are evident from the report published.

Table 5: Achievements by Indicators, 2001-2012

SN	Indicators	Achievements (In Years)			
		2001	**2006**	**2012**	**Targets 2015**
1	Gross Enrollment Rate of Early Childhood Development / Pre-primary Education	12.8	41.4	73.7	80
2	Percentage of New entrants at Grade I with ECD/PPE experiences	7.8	18.3	55.6	80
3	Gross Intake Rate at Grade I	122.9	148	137.7	102
4	Net Intake Rate at Grade I	-	86	91.2	98
5	Gross Enrolment Rate of Primary Level	124.7	138.8	130.1	105
6	Net Enrolment Rate of Primary Level	81.1	87.4	95.3	100
7	% GNP channeled to education	1.8	87.4	95.3	100

SN	Indicators	Achievements (In Years)			
		2001	2006	2012	Targets 2015
8	% of Education Budget channeled to Primary Education	1.8	2	2	2.5
9	% of Teachers with required qualification & training	56.7	60	60	65
10	% of Teachers with required certification license	15	60	98.4	100
11	Pupil Teacher Ration	-	100	100	100
12	Repetition Rate	39.9	46	26.90	30
13	Grade I	38.7	29.8	19.90	10
14	Grade V	9	10.4	5.30	8
15	Survival Rate to Grade 5	65.8	80.3	84.10	90
16	Coefficient of Efficiency	60	-	-	80
17	Percentage of Learning Achievement at Grade 5	40	-	-	80
18	Literacy Rate				
19	Age Group 15-24	70	-	84.7	95

3. Percentage of Schools that Offer

3.1. Primary/ Basic level of Education, 2012/13

Table 6: Primary/Basic level of Education

Region	Total Schools	Primary Level (Up to Grade V)	Basic Level (Up to Grade 8)	Share of Primary Level %	Share of Basic Level %
Total	34782	26495	12513	76.2	36
Eastern	7449	5761	2513	77.3	33.7
Central	10248	7752	4008	75.4	39

Region	Total Schools	Primary Level (Up to Grade V)	Basic Level (Up to Grade 8)	Share of Primary Level %	Share of Basic Level %
Western	7649	5718	2741	74.8	35.5
Mid-Western	5405	4148	1747	76.7	32.3
Far Western	3995	3116	1549	78	38.8

3.2. Primary/ Basic level of Education, 2012/13

Indicator	1995/96			2003/04			2010/11			2015
	M	F	T	M	F	T	M	F	T	
Youth Literacy (15-24)	73.4	40.6		55.5	80.6		60.2	70		93
Literacy (6 Years and Above)	52.2	24.4	37.8	63.5	38.9	50.6	72.2	51.4	60.9	90
Adult Literacy (15 Years and Above)	53.5	19.4	35.6	64.5	33.8	48	71.6	44.5	56.5	75
GPI (Adult Literacy)			0.36			0.52			0.62	1

Table 7: Primary/Basic level of Education

3.4. Total Number of Schools in Nepal - 20 Years Trend

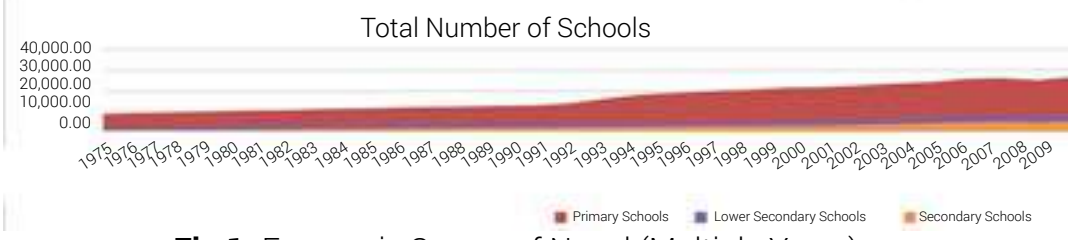

Fig 1: Economic Survey of Nepal (Multiple Years)

3.5. Total Number of Students - 20 Years Trend

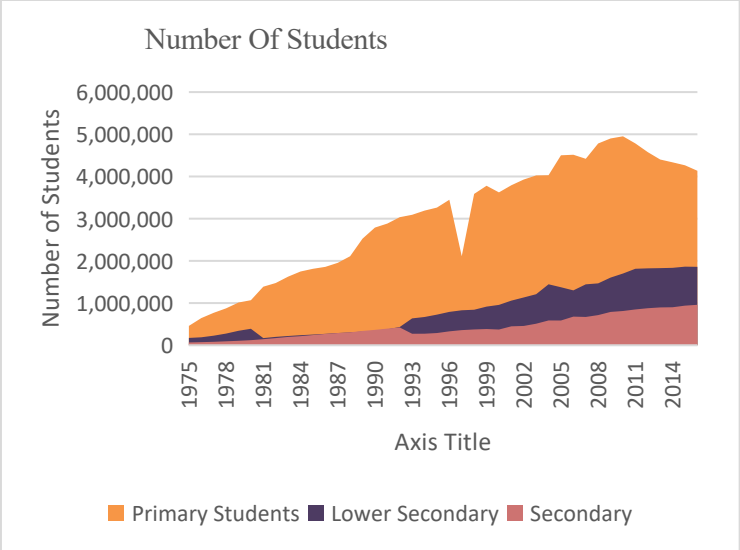

Fig 2: Flash Reports, Ministry of Education (Multiple Years)

3.6. Total Number of Trained Teachers - 20 Years Trend

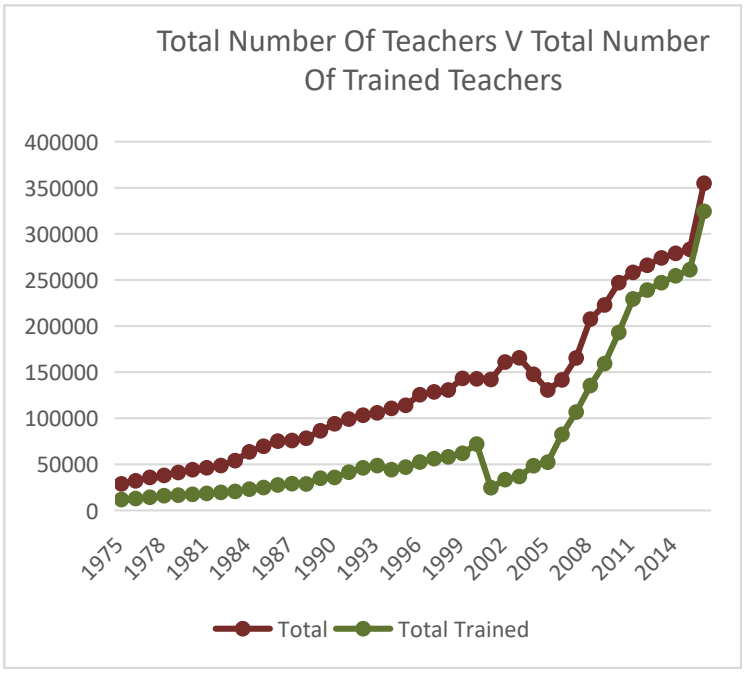

Fig 3: Flash Reports, Ministry of Education (Multiple Years)

4. Education of Act 2016

With the implementation of the new Education Act 2016 (2073), a couple of changes were made. The bill changed the present three-tier school level education system to a two-tier one and did away with the SLC (School Leaving Certificate) exams for 10th graders.

SLC was renamed to SEE, Secondary Education Examination. From that point foward, schools would run classes one to eight under basic education and classes nine to twelve under the secondary school system. The SLC exams would be held for 12th graders. With this HSEB, Higher Secondary Education Board, responsible for looking after 10+2 program was scrapped and brought under the purview of NEB, the National Examination Board. Provisions are being made to restructure the education system under new federal structure after the promulgation of the Constitution of Nepal 2015. The other change with this Act was that the Ministry of Education was renamed to the Ministry of Education, Science and Technology. The overall structural reforms that have been carried out since the Rana Regime to date can be summarized as follows

Table 8: Education of Act 2016

Year	Primary	Lower Secondary	Scondary	Higher Secondary	System	Policy
1939	1-3	4-7	8-10		3+4+3=10	NNEP
1954	1-5	-	6-10	11	5+5=10	NEP
1961	1-5	-	6-11	12	5+6=11	NEP
1971	1-3	4-7	8-10	11-12	3+4+3=10	NEP
1981	1-5	6-7	8-10		5+2+3=10	CDC
1992	1-5	6-8	9-10	11-12	5+3+2=10	NEP
2006	-	-	1-8	9-12	8+4=12	SSRP
2016			1-8*	9-12**		

5. A Brief History of Information & Communication Technology in Nepal

The brief history of ICT in Nepal can be dated back to 1913of with the start of telecommunication service in Nepal. Telephone lines were installed for the first timeand open wire trunk service was established between Kathmandu and Raxaul a year later. In 1951, Radio Nepal started broadcasting and transmission lasted for 4 hours and 30 minutes through a 250-watt short-wave transmitter. The Radio Act came into being in 1957. In 1962, government first officially started using FACIT electronic calculators. Computers first made

its inroads in Nepal and were used in processing the census data back in the 1960s. A decade later, 1971, IBM 1401, a second generation computer was used by the government to process census data. National Computer center was officially started in 1974. The first foreign direct investment in software development was made in 1982 with a company called Data Services International. State owned Nepal Television started broadcasting in 1985. The 1990s saw the proliferation of private IT companies in Nepal with the deregulation of the market. National communication policy was formulated in 1992. In the same year, Computer Association of Nepal was formally established. Institute of Engineering officially launched its first engineering course in computing in 1994.

The Internet was first introduced into Nepal in 1993 in a venture of the Royal Nepal Academy of Science and Technology (RONAST) and a private company, Mercantile Office Systems (MOS). The Indian Institute of Technology in Bombay had a UNDP-funded Internet connection through the Education and Research Network (ERNET) project, and RONAST set up a system whereby they could connect on a regular basis to ERNET in Bombay to transfer e-mail messages. The service was only for the use of RONAST's scientific community. The phone connection was of low quality and expensive because of the daily international call charges to Bombay, though, and the project soon ended. In 1994, after RONAST ended its ERNET project, MOS acquired the technology and set up the first commercial e-mail service with a link to Australia. The MOS server connected several times a day to transfer messages[26].

The Internet came into the picture in mid-July 1995 when Mercantile Communications started with dial-up email service. In 1997, the telecommunications regulation was floated with the formation of Nepal Telecom Authority. The first step in officially promulgating ICT policy dates back to 1997 when the Ministry of Science and Technology (MoST) applied for a grant policy formulation and ICIMOD was awarded to lead. Cellular telephone service was launched by Nepal Telecommunication Corporation in 1999. The first IT policy was rolled out in 2000. In 2003, with the Prime Minister as the official chair, the HLCIT, High Level Committee for Information and Technology, was formed. It had a powerful vice chair, secretaries of two line ministries (Science and Technology as well as Information and Communications), and the president of the Computer Association of Nepal as its members. Although IT policy called out for review every two years, to "keep up with rapid technological changes", it was not until 2010 that the country finally had a revised IT policy

5.1 Current State

The IDI, ICT Development Index, report ranks all its member states in terms of what it calls IDI rankings. The report is published annually by the International Telecommunication Union, ITU. ITU was founded in Paris in 1865 as the International Telegraph Union. It took its present name in 1934, and in 1947 became a specialized agency of the United Nations and is an organization based on 'public-private' partnership of 193 countries as well as 800 public sector entities and academic institutions.

In its 2016 report, Nepal's IDI ranking is 139th out of 175 member states. It improved by one position in 2017. Nepal not only ranks low but also fails to make any progress compared to the year before. In terms of ICT access, Nepal ranked 143rd in 2016 from 144th in 2015. In ICT use, Nepal ranked 143rd in 2016 improving its position by one rank. Our standing in terms of ICT skills was slightly better than the other two—though it still stands at 138th. In a singular global standing, we fail miserably, ranking 142nd out of 175 countries. In a regional standing, Nepal ranks 28th out of 34 countries that are part of Asia Pacific region. Within SAARC, Maldives tops the list of IDI ranking followed by Sri Lanka, Bhutan and India. Nepal ranks fifth. The remaining positions are occupied by Bangladesh, Pakistan and Afghanistan. It's worth noting that out of these eight member states Bhutan made the most significant jump by climbing up in five positions. The same report also gives some interesting details that help us understand our position better.[14] For instance, our cellular telephone subscriptions per 100 inhabitants have grown significantly from 4.46 in 2006 to 123.3 in 2017.

6. Mobile Cellular Subscription Data

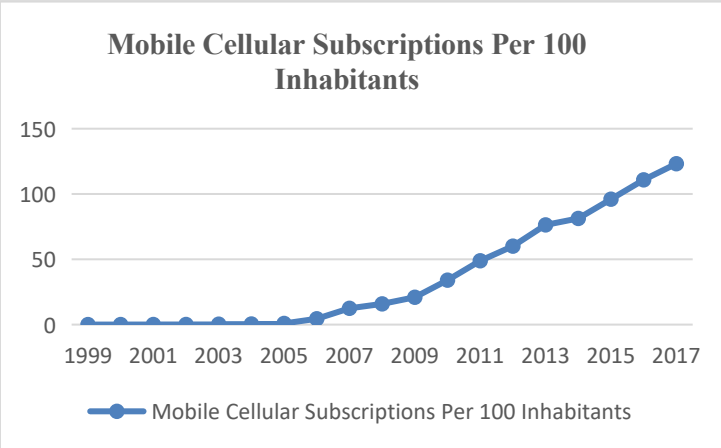

Fig 4: Mobile Cellular Subscriptions Per 100 Inhabitants

The percentage of households with a computer has risen from 8.9 in 2015 to 14 in 2007 and the percentage of households with Internet access from 6.3 in 2015 to 14 in 2017 [14]. In percentage, 21.4 % of total population were connected to the Internet in October 2017.

7. Internet Penetration Data

In essence, while the mobile phone penetration may have increased rapidly, it can be said that the household level connectivity is rather dismal in Nepal.

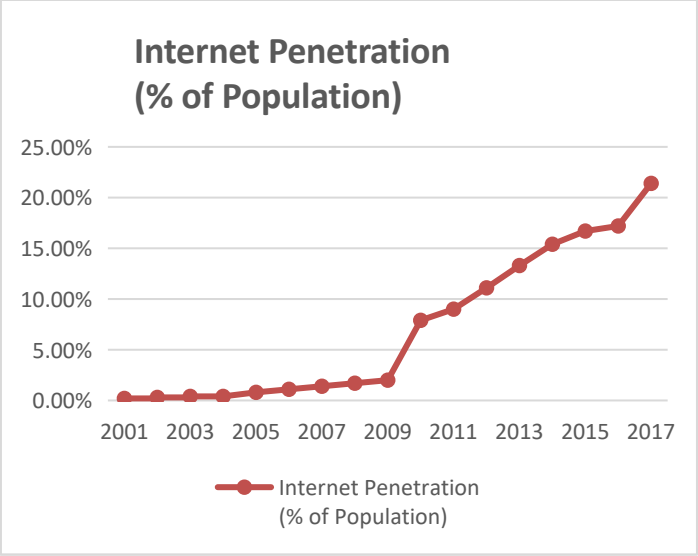

Fig 5: Internet Penetration (% of Population)

8. Investment in Education in Nepal

Nepal's education system broadly categorizes its educational institutions into Public Schools, Universities and Technical Education and Vocational Training Council; all of which have separate basket funds consisting of funds from the government, donations, and an amount generated from fees, grants and funds from other sources. The budgetary allocation in education has risen from 98,642,700,000 in 2015/16 to 134,508,700,000 in 2016/17. The significance allocation was made for tech-friendly education with free broadband internet to all of the schools. Also, it's worth taking note of these numbers. Out of 35,222 schools, only 26% of them are privately run, the rest are public. Even though the private sector accounts for 26% of schools, only 17 % of the total student population are catered by these schools. On top of it, majority of private schools are located in the cities and towns and State 3 alone accounts for a total of 51% of such private institutions.

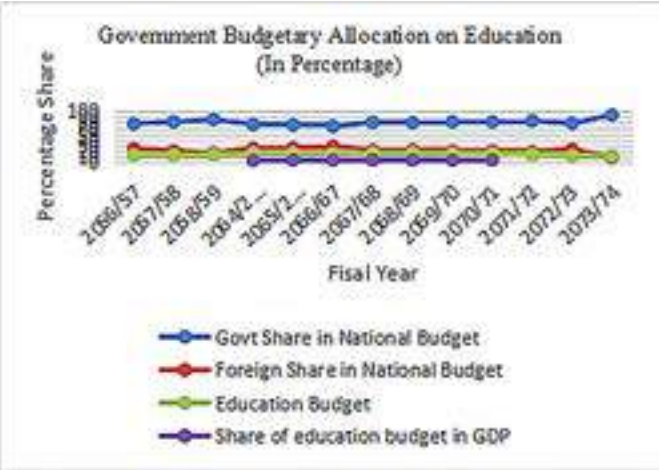

Fig 6: Government Budgetary Allocation on Education

The last eighteen years of budgetary allocation in education compiled from multiple reports published by the Ministry of Education "Education in Figures" show the following trend.

In spite of somewhat declining but still significant investments in education, the outcomes have barely been satisfactory. After spending large sums of money from the limited funds available, Nepal has shown its desire to be innovative, efficient and cost-effective to address everyday challenges. In this regard, apart from larger policy reform attempts, the emergence of various ICTs and their increasing acceptance and adoption are something that the government has been pushing very hard. It is worth remembering that while there is no conclusive research to prove that there is a higher level of student achievement when ICTs are used in the education space, there is a general consensus among academicians and practitioners that it does have some kind of positive impact on the learning environment [32].For example, Walker et al. provided a comprehensive comparison study from Microsoft's laptop computer program. Out of eight laptop schools and three non-laptop schools, it was found that 'laptop teachers' showed considerable shift towards use of more constructivist pedagogical practice translating in improved writing skills and confidence in use of computers [40].

9. ICT in Education Nepal - Policy Endevours

ICT in education is comparatively a new phenomenon as evident from the fact that a report produced by Development of Science Technology in Nepal [37] makes no mention of "Computers" vis-à-vis their use in learning. However, in the last decade or so, ICT in our education policy has been gaining prominence. Bhatta [4] cites four crucial changes taking place globally and nationally making this period an appropriate time for Nepal to leap into the world of ICT based education. These changes include (i) integration of

national economies to global economies, (ii) progressive increase in quality and rapid decline in the price of computers and other ICT based hardware, (iii) declining cost and continuing expansion of the Internet and (iv) continuing expansion of a global community dedicated to contributing open-source software and open content digital materials for public use.

In relation to ICT use in education vis-à-vis policy formulation, 2010 IT policy, the revised version of first IT policy of 2000, briefly touched upon it. The 2010 IT policy made the first inroads by (i) including computer education in curriculum from the school level and (ii) expanding the access of the Internet into schools and create an environment in which establishing ICT structures in educational institutions is feasible. ICT in Education Master Plan 2013-2017 made significant progress by (i) expanding equitable access, enhancing quality, reducing the digital divide and improving the service delivery system in education through the use of ICT. Furthermore, the ICT in education master plan.[25] serves as the cornerstone from government's side to identify the need for "explicit ICT in education policy in Nepal." This Master Plan includes four major components on ICT in education: ICT infrastructure including internet connectivity, human resources, content development and system enhancement. The Master Plan was devised after a meeting of consultants in Pokhara.

Regional Consultation Program for the Preparation of ICT in Education Master Plan was organized at Pokhara, Kaski on 2068/08/18 (Dec 4, 2011). Ministry of Education (MoE) has organized a regional consultation program on preparation of ICT master plan in Pokhara , Kaski on 4th Dec 2011. Main objective of this consultation and interaction program was to collect view points from different stakeholders of the ICT in education master plan.

ICT Policy 2015 took ICT as the means for quality in education and gave priority to e-school, e-learning, e-education, and capacity building. The Fourteenth Periodic Plan focused on (i) minimizing the digital divide through ICT as an integral part of the education system and (ii) use of ICT in education and support in Math, Science and English using distance education, e-learning and interactive learning [30].

The SSDP, School Sector Development Plan 2016-2023 [24], has a separate section in the report titled "ICT in Education" where it mentions

...has a more detailed emphasis on 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 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 considers the use of and knowledge of ICT essential.

In the same document, it highlights the importance and significance attached to ICT in education by mentioning "expanding role of ICT in all areas of life". Specifically, it sees ICT as important tool to (i) improve classroom delivery, (ii) increase access to learning materials and (iii) improve the effectiveness and efficiency of educational governance and management.

The growing importance of ICT in education is evident from the fact that in a similar policy document, School Sector Reform Plan, SSRP 2009-2015 [1] under Governance and Management discusses various intervention measures like the building of new classrooms, construction of libraries and laboratories and so on. It specifically mentions agencies responsible for carrying out the task like Department of Education, District Education Office and School Management Committee responsible for building schools and getting the process rolled out by 2009/10. However in the case of ICT assisted teaching and learning, the task assigned to DOE, it clearly mentioned 'currently no funding is available for this work' along with no time frame to complete the process task. The other mention of ICT in education in SSRP 2009-2015 makes a reference to MoE's ICT Master Plan by saying 'ICT... is aimed at improving the speed of internal communication and staff access to essential working documents and information'. It also places a disclaimer by saying "...much more needs to be done to fully understand and develop a strategy on how the Ministry can benefit from the opportunities offered by modern ICT".The MOE will invest in the development of human resources and the regular review and updating of ICT competencies[1]. The policy document also continued emphasis on improvement of EMIS, Education Management Information System, as a tool for governance and management.

SSDP's strategies for improving knowledge of and the use of ICT are as follows: (i) Establish an ICT enabling learning environment by including ICT prerequisites as enabling conditions in secondary schools and the provision of ICT infrastructure and teaching-learning materials for pedagogy; (ii) Establish ICT learning centers in model schools with enhanced teaching-learning processes; (iii) Incorporate ICT in the secondary curriculum through the

development of professional development packages and guidelines; (iv) Develop need based educational materials for children with visual and hearing impairment and support computer education in secondary deaf schools; (v) Develop portals and websites including e-libraries; (vi) Train teachers on the use of ICT in teaching and learning; (vii) Develop online and offline training courses and materials (focusing on Science, Math and English); (viii) Prepare ICT teaching and learning materials, initially for Science, Math and English; (ix) Develop and distribute subject-wise e-learning resources for students and teachers and establish a repository of them; and (ix) Strengthen school governance and management through a strengthened EMIS, including the enhanced use of ICT to improve the EMIS and implement a unified accounting software, the Computerized Government Accounting System (CGAS) in MoE [21].

10. Implementation of ICT in Education in Nepalese Schools

The implementation of ICT in education in school set up has to be looked into from different four different components: infrastructure development that includes setting up of computers and other supporting devices, electricity, Internet connectivity; human resources, content development and system enhancement

10.1. Infrastructure

Open Learning Exchange (OLENEPAL), was established in 2007 with the initiative of Ravi Karmacharya and Bryan Berry. With initial support from Local Authority Grant provided by Danish Government the project made a kick start.

The OLPC-Nepal project began with the efforts of two Nepali engineering students named Shankar Pokharel and Ankur Sharma [13]. These two students were responsible for raising awareness at the grassroots level of the potential of OLPC to positively impact the educational system of Nepal. They contacted OLPC expressing their interest in starting an OLPC chapter in Nepal.

The project was taken over by OLE (Open Learning Exchange). OLE-Nepal is a non-governmental organization dedicated to assisting the Government of Nepal in meeting its Education for All goals by developing freely accessible, open-source Information and Communication Technology (ICT)-based educational teaching-learning materials. OLE's responsibilities ranged from distribution of laptops to the training of teachers and the technical support. Meanwhile, the Nepal Government has three-tier committees to

implement OLPC in Nepal under Ministry of Education: Steering Committee (the chair is the Secretary of Ministry of Education), Coordination Committee (the chair is the Director of Department of Education), and a Task Force (the chair is the Deputy Director of Department of Education). This combination of grassroots and government support was an important factor in the success of the project in Nepal.

OLE partnered with the Nepalese Government Department of Education in order to distribute laptops in Lalitpur District. Pilot schools selected were the Bishwamitra Ganesh Secondary School and the Bashuki Lower Secondary School. There were 135 laptops deployed to students in Grades 2 and 6 in both schools on April 25th, 2008. It has now deployed over 5900 laptops deployed in over 340 schools [31]. The unique feature of OLE Nepal's content delivery is it provides a "server", portable hard disk which can be connected to individual machines via low-cost Raspberry Pi negating the need for internet to access classes.

These 100 dollar tamper proof laptops were considered ideal for students in rural areas where there was no electricity and no Internet. However, the OLPC program could not satisfy the clientele needs and the government has decided against taking it to national level (Dhital, 2018). Global press reported that the "idea" of a $100 cost was unreal—the actual price actually crossed over $200 [33]. Organizations like Help Nepal Network (HeNN), a global network of volunteers, set up fifteen e-libraries in twelve districts of Nepal.

Under the matching grant scheme of 80-20, Rs160,000 were given to school to purchase four computers and one printer, with 20% of school's share. At the moment, under the implementation of SSRP, government has committed to support school computer program with a matching fund of Rs200,000 if they claim to have computer infrastructure ready with government providing 80% of the committed sum as their share and provide computer training to teachers.[10] According to an ADB report, a total of 1453 schools received Rs140,000 each from MOE over the three fiscal years - 356 schools in fiscal year (FY) 2010, 428 schools in FY2011, and 668 schools in FY2012 [2].

"The sum of Rs 200000 was expected to purchase and install five computers, purchase and install one printer, arrange for digital content and learning materials for grades 1–10, internet connection and continued operation, train at least one teacher on computer hardware and software, and arrange alternative energy source in schools without electricity."

However, the ICT equipment in schools are 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.

Throughout the years, allocation on ICT in education has been continually growing with more specific targets in mind. The SSDP, School Sector Development Plan, identified development of ICT facilities, ICT pedagogy teaching and learning materials through establishment of model schools. However the key focus of the plan vis-à-vis use of ICT was focused on 'strengthening of performance of secondary schools' with the identification of (i) development of portals and websites including e-libraries, (ii) revision of textbooks to use of ICT and more importantly, and (iii) equipment grants for ICT and science. The target aimed to achieve was 6,040; 5,940; 5,840; 5,740 schools for first four years of the program with total amount of USD58.05 million under the heading "strengthening teaching-learning process through application of ICT" for the first five years of the program starting from 2016/17. In the overall heading under SSDP expenditure framework by cost categories ICT was allocated USD237 million, 2.1 percent of total cost estimates of nearly USD678.4 billion for the entire SSDP program.[21]

The core objectives of SSDP are to use ICT in public schools stood out as follows: (i) The appropriate use of ICT to improve classroom delivery by establishing an ICT enabling learning environment (including institutional and professional capacity of managers and implementors) and based on need and context; (ii) Appropriate development access to learning materials and supporting professional development packages and guidelines to ensure adequate capacity for incorporating these in the curriculum; and, (iii) The use of ICT for the improvement and increased effectiveness and efficiency of overall educational governance and management.

From 2016, NTA via the Rural Telecommunication Development Fund is taking the initiative to deliver broadband services to schools (based on eligibility) across the country.

10.2 Content Development

The development of websites of national, regional and district level educational organizations has been mandated by the Department of Education. Most of the urban and semi-urban districts do have a working website, but many are barely functional.

OLE Nepal, through its "e-pustakalaya", or "e-library" provides "education-focused digital library containing full-text documents, images, videos and audio files that can be accessed through an intranet or the Internet. The user can either read documents, view videos, and listen to audio clips directly from the E-library server or she can download these materials to her personal computer and view them later"[43].

On November 16, 2016, Nepal's Department of Education published a notice to all 'students, teachers, schools and District Education Offices' of Nepal to use OLE Nepal's digital content — E-Paath, and digital library — E-Pustakalaya. The notice urged all parties addressed to commence the use of all interactive digital content created and curated by OLE Nepal, in partnership with Nepal's Department of Education, Curriculum Development Center (CDC), and National Center for Education Development (NCED), by visiting the digital library website at www.pustakalaya.org. NCED, post the earthquake started broadcasting Virtual Classes (Video Recorded Lectures) to 100 schools of 11 affected districts. MiDas eCLASS, a product of MiDas Education, developed and started selling eClass content which was state of the art, customized software based on the government curriculum. Although this is popular with over 600 schools using the eduKit, it has been criticized for being expensive. NCELL, a private telecommunications service provider, offers an online package "…would be able to download exclusive Tutorial videos, animated lessons and text-based content approved by CDC Nepal paying a subscription fee." [42] Kul Techno Lab and Research Center provides free online tutorials under the domain, Kullabs.com. The site has an ensemble of all the various material available on the Internet and hence neither does it have any content dedicated to local students (as it does not adhere to national curriculum) nor is the medium Nepali. Deerwalk Learning Center, a not-for-profit unit of Deerwalk Group, is currently developing and broadcasting free online classes developed in the mold of khanacademy.org under the domain dlc.dwit.edu.np.

The National Centre for Educational Development (NCED) has been providing training to teachers through National Radio and FM. Also, it has been developing a recorded class and airing it on one of the Nepali TV channels, NTV Plus. Mahabir Pun through his NWPN, started taking Internet to village schools and setting up computers that schools and community could use. As of 2011, over 150 villages had been connected.

"..On his return in 2001, Mahabir's dream received a jolt. He was stunned by the yawning gap between the Information and Communication Technology he was used to at Nebraska and the stone age level that he now had at Nangi. Instead of brooding over "his fate", he had an inspiration and on an impulse, sent a message to the British Broadcasting

*Corporation (BBC), asking for ideas to connect such remote villages to the outside world through the Internet. BBC broadcast it on their famed and popular World Service and published it on their website. The response was overwhelming. The e-mail was read by many foreign students and volunteers who were eager to contribute to the mountain village through voluntary services. Within days, offers of help began to arrive. It started as a trickle; a used PC here, a server there. [*34]

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 II to VI in Nepali, Mathematics, English and Science.

10.3 Training

Use of ICT in teachers training has been well documented but not so much in the case of how to make use of ICT in the classrooms. For instance, a pilot program was launched in 1980-86 to train teachers to enhance their teaching capabilities. Under Radio Education Teacher Training Program, a 150 hour basic program was provided with support from USAID. Apart from training provided by OLE Nepal, there's no mention of ICT specific training provided to public school teachers by the government which ironically is one of the key priority areas.

Summary

While we do acknowledge the fact that there are multiple variables that weigh both for and against the use of ICT in teaching and learning process, with 'for' arguments serving as a norm rather than "against", what has not yet been discussed is, at the end of the day "Whose computer are we talking about?" Are we using computers so that it makes teaching easy or learning easy? According to Zhao, Hueyshan, & Mishra [45], educational technology has often been about solving teachers' problems with technology. Although the ultimate goal is to enhance student learning, which is paradoxically the teacher's problem, technology has always been viewed as a tool to help teachers teach better. The idea of this paper is not to get into this discussion but at the same time appreciate the fact that there is no escaping either.

An enormous amount of funds have been poured into integrating ICT in education in public schools with the obvious expectation of improved teaching and learning outcomes. We thoroughly need to understand the challenges we are facing in its implementation, which

is but obvious, from multiple perspectives. The paper makes the attempt to understand the use or non-use of ICT in education – beginning with the understanding of evolution public education system, ICT development and in-between connections in context of Nepal.

Reference

1. Ministry of Education. (2009). *School Sector Reform Plan 2009-2015.* Kathmandu: Ministry of Education.
2. ADB. (2017). *Innovative Strategies for Accelerated Human Resource Development in South Asia Information and Communication.* Manila: Asian Development Bank.
3. Aryal, K. R. (1977). Education during Rana Regime. *Nepal Digest : Nepal Education Special,* pp. 121-130.
4. Bhatta, S. D. (2008). Tackling the problems of quality and disparity in Nepal's school education: The OLPC Model. *Studies in Nepali History and Society,* 17-48.
5. Caddell, M. (2007). Education and Change : A Histori cal Perspective on Schooling, Development and Nepali Nation-State. In K. a. Kumar, *Education and Social Change in South Asia.* (pp. 251-284). New Delhi: Orient Longman.
6. CBS. (2011). *National Population and Housing Census 2011, Vol. 2.* Kathmandu: Central Bureau of Statistics.
7. CBS. (2011). *Nepal Living Standards Survey 2010/11.* Kathmandu: Central Bureau of Statistics.
8. CBS. (2012). *National Population and Housing Census.* Kathmandu: Central Bureau of Statistics.
9. CDC. (2012). *Basic Curriculum - Grade VI-VIII.* Bhaktapur: Curriculum Development Center.
10. Dhital, H. (2018). Opportunities and Challeneges to Use ICT in Government School Education of Nepal. *International Journal of Innovative Research in Computer and Communication Engineering,* 3215-3220.
11. DOE. (2013). *A Study on out of school children and verification of data.* Bhaktapur: Department of Education.
12. EFA NPA. (2015). *EFA National Plan for Action 2001-2015.* Kathmandu: UNESCO.
13. http://wiki.laptop.org/go/OLPC_Nepal. (n.d.). Retrieved 03 01, 2018, from http://wiki.laptop.org: http://wiki.laptop.org/go/OLPC_Nepal
14. International Telecommunications Union. (2017). *Measuring the Information Society Report.* Geneva: International Telecommunications Union.

15. ITU. (2017). *International Telecommunication Union.* Durham: International Telecommunication Union.
16. Jonassen, D. H. (1990). Thinking technology: Toward a constructivist view. *Educational Technology,* 32-34.
17. Landon, P. (1976). *Nepal.* Kathmandu: Ratna Pustak Bhandar.
18. Liechty, M. (1997). Selective Exclusion : Foreigners, Foerign Goods, and Foreignness in Modern Nepali History. *Studies in Nepali History and Society,* 5-68.
19. Mihaly, E. (1965). *Foreign Aid and Politics in Nepal: A Case Study.* London: Oxford University Press.
20. Ministry Of Education. (1956). *The Five Year Plan for Education in Nepal.* Kathmandu: Bureau of Publications, College of Education.
21. Ministry Of Education. (2016). *School Sector Development Plan 2016 - 2023.* Kathmandu: Government of Nepal.
22. Ministry Of Education. (2016,2014,2008). *Education in Figures - Multiple Years.* Kathamandu: Government Of Nepal.
23. MoE. (1971). *The National Education System Plan for 1971-1976.* Kathmandu: Ministry Of Education.
24. MOE. (2016). *School Sector Development Plan (2016-2023).* Kathmandu: Ministry of Education.
25. MOE, G. o. (2013). *ICT in Education Master Plan. ICT in Education Master Plan 2013-17.* Government of Nepal.
26. Montgomery, L. (n.d.). *https://onlinelibrary.wiley.com/doi/full/10.1111/j.1083-6101.2002.tb00141.x.* Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1111/j.1083-6101.2002.tb00141.x.
27. NCED. (2018). *Basic information about Education.* Kathmandu: NCED.
28. NEC. (1992). *Report of the National Education Commission.* Kathmandu: National Education Commission.
29. NEPC. (1955). *Education in Nepal: Report of the National Education Planning Commission.* Kathmandu: Bureau of Publications.
30. NPC. (2016). *14th Plan - (FY 2016/17-2018/19).* Kathmandu: National Planning Commission.

31. OLE. (2017, 9 18). *http://www.olenepal.org/*. Retrieved September 18, 2017, from http://www.olenepal.org/: http://www.olenepal.org/
32. PricewaterhouseCoopers. (2010). *Information and Communication Technology for Education in India and South Asia.* NewYork: PricewaterhouseCoopers.
33. Robertson, A. (2018, 6 4). *https://www.theverge.com/2018/4/16/17233946/olpcs-100-laptop-education-where-is-it-now*. Retrieved from https://www.theverge.com/: www.theverge.com
34. Sæbø, Ø., & Thapa, D. (2014). Nepal Wireless Networking Project: Building infrastructure in the mountains. *Communications of the Association for Information Systems,* 241-256.
35. Sardar Rudra Raj Pandey, K. B. (1956). *EDUCATION IN NEPAL.* Patna: THE BUREAU OF PUBLICATIONS.
36. Sellar, P. O. (1981). U.S. *Aid to Education in Nepal: A 20 Year Beginning. A.I.D. Project Impact Evaluation Report No. 19*. Arlington: Agency for International Development.
37. Singh, R. M., & Bhuju, D. R. (2001). *Development of Science and Technology in Nepal*. Kathmandu: Department of Science and Technology.
38. UNESCO. (2012). *EFA Global Monitoring Report - Youth and skills: Putting education to work.* Paris: UNESCO Publishing.
39. L. Vygotsky, (1934). *"Thought and language."* Massachusetts: M.I.T. Press.
40. Walker, L. R., & Chessler, M. (2000). *A More Complex Picture:Laptop use and Impact in the Context of Changing home And School Access*. San Fransisco: Microsoft.
41. www.doe.gov.np. (2017, 9 29). *http://doe.gov.np/content/about-department-of-education-nepal.html.* Retrieved from www.doe.gov.np: http://doe.gov.np/content/about-department-of-education-nepal.htm
42. www.ncell.axiata.com. (2018, 9 30). *https://www.ncell.axiata.com*. Retrieved from *https://www.ncell.axiata.com: https://www.ncell.axiata.com/*
43. www.pustakalaya.org. (2018, 9 18). *http://www.pustakalaya.org.* Retrieved from *http://www.pustakalaya.org:* www.pustakalaya.org
44. Yadav, R. P. (1982), "Implications of Education for Economic Development." *11th Annual Conference on South Asia, University of Wisconsin.* Oceanside, Oregon: American-Nepal Education Foundation.
45. Zhao, Y., Hueyshan, S., & Mishra, P. (2000). Teaching and Learning: Whose computer is it? *Journal of Adolescent & Adult Literacy,* 161-171.