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Implementing ACT-Based Modalities for Establishing Connectivity among Teachers and Students in the Context of COVID-19

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Abstract**: The government aims to make education accessible to all the people of the country can be fulfilled if the online education system is developed enough for all. The country may be benefited by the use of the right type of education system. Learners and teachers get advantages if the education system is reformed using digital technologies like Automatic Call Tree (ACT)-based modalities. Such types of education system has key significant in the pandemic situation which have been facing since two years. This study is assumed to examine the Automatic Call Tree (ACT) based modalities and their utilization for connection between students, teachers, parents and school management committee; and some recommendations are made concerning online education. The main information source for this study is primary. Instruments used are questionnaires, interview with video recording, phone call, and class room observation. The preliminary finding showed that there is a scarcity of orientations of online education to parents, students, teachers, and administrators, though all were found to realize its importance. Likewise, major problems found are lack of digital devices, regular power supply and backup; and network connectivity. Based on the opinions of the respondents and observations of the situations of the different parts of the country running online education during this pandemic period, many recommendations are made. The country needs strategic plans and policy to make online education accessible to all learners specially in urban areas of Nepal and this will ensure online education smooth. It concludes that the Automatic Call Tree (ACT)-based modalities became fruitful for some schools of Nepal during Corona Virus (COVID)-19 pandemic. But many of them are facing different problems while conducting online classes, examination and result processing. Providing practical knowledge and skills about engineering, mathematics, health science, account, computer science subjects are very difficult and to examine them.

Keywords- e-learning, Covid-19, online education, ICT education, virtual learning, distance education

1. INTRODUCTION

Today's world is rapidly changing due to ICT. The integration of ICT into education is crucial for realizing the society's everlasting desire to improve its way of life. The education in school by means of information and communication technology (ICT) can supplement, enhance, and change education for better improvement[1]. The application of ICT in developed countries has empowered teachers and learners, promoted changes, and fostered and developed if 21st century skills, and the data to support these beliefs are rigorously enhanced. There is wide spread belief that ICTs can and the will empower teacher-dominated to student-centered. This transformation result in an increase in learning gains for students, creating and allowing learners to development their creativity like problem-solving abilities, reasoning skills, communication skills, and other higher-order thinking skills[2].

According to a UNESCO report [2], 1.6 billion children across 213 countries have been severely impacted by the temporary closure of the educational institutions. In order to mitigate the effect, educational institutions have responded to the closure differently in different contexts, both materials and human, available to them. A large portion of the choices need to join creative advancement so as to give probably some type of instructive reason. As distance and online education is needful on mechanical offices, including web and Wi-Fi, the differences that exist in their accessibility are extending the holes in access nature of training.

The government aims to make education accessible to all the people of the country can be fulfilled if the online education system is developed enough for all. The country may be benefited by the use of the right type of education system. Learners and teachers get advantages if the education system is reformed using digital technologies like Automatic Call Tree (ACT)-based modalities. Such types of education system has key significant in the pandemic situation which have been facing since two years in Nepal. Many of the study on COVID-19 show that pandemic has worse affected students learning and prosperity, and that possibly enlarges the fleabags among advantaged and delayed students in their impartial access to quality education. Moreover, the finding recommend at Nepal has increased various ICT and training since 2000 [7].

The different involvements, integrating ICT, has been initiated in schools for strengthening both teaching and learning. However, the incorporation of ICT in government education has been facing numerous difficulties. Recently, ICTs have not been utilized efficiently as a method of gaining knowledge, securing new information, and building capacities and skills in schools of Nepal because of a lack of strong implementation of education programs incorporating ICT and restricted access to ICTs across all reasons of the nation. Due to lack of ICT infrastructure, absence of qualified teaching staff, lack of strong motivation to use ICT for education, lack of affordability owing to expensive digital technology for poor students [4].

The present world today is experiencing the COVID-19 pandemic. This circumstances has gravely affected the way of life and live hood of the individuals. Various measures are being compulsory around the globe to contain the spread of this disease. The Government of Nepal also imposed nationwide lockdown as a strategy to prevent the transmission of COVID-19 since 27th March 2020 which has been extended multiple times and it is still unclear to what extent this situation would proceed. Therefore, a large number of school-going childrens are restricted from going to their schools and universities. Assignment of potential modalities to continue education and careful planning is needed to come with appropriate models for

limiting the long term significances of this shutdown. However, such studies are lacking in Nepal due to COVID-19[7].

In this context, the application of ICT in the education sector across the nation seems desirable. While developed nations are more ready to move to advanced web-based learning methodologies, the situation is extremely blended in developing nations like Nepal. There are cities, well equipped which ICT infrastructures where online classes using different mediums such as Google Meet, Zoom, Skype and What Apps are already being widely used while there are areas which are even lacking of proper mobile phone network [17]. The possibility of inequality in accessing technology might exist but fortunately, we are seeing a great deal of inventiveness in numerous nations. The basic notion is to utilize all possible conveyance modes of ICT that is available and feasible depending upon the context. Radio and TV are exceptionally amazing assets and it emphasizes that remote learning isn't just about web-based learning and is more to words blended media learning. Also this can helpful and unbiased to both differently able and financially weak students [4].

However, remote learning has not been adapted in the government education system in Nepal, or the information revealing such intervention is not widely available. A quick telephone and field data survey was conducted, by Local Development Training Academy (LDTA) in the school of Morang, Sunsary, Makwanpur, Kathmandu, Latipur, Bhakktapur, Chitwan, Nawaparasi, Rupandehi, Kapilvastu, Gulmi, Pyuthan, Dang, Banke, Surkhet, Kailali indicated that currently the public schools have conducted only very limited to null activities to connect the students and teachers [4].

Limited activities include visiting students' homes, counselling through phones, delivering classes through FM radios and Televisions. In fact, the majority of the schools are waiting for the lockdown to be uplifted. But it was also noted that the majority of the students have at least a cell phone in their home though they lack personal mobile phone [14].

In this situation, it becomes desirable to implement Automatic Call Tree (ACT)-based modalities in the school of all 7 provinces of Nepal to cope up the current situation of students, teachers and school management committee in terms of their access to ICT infrastructure across different contexts of the nation via mobile phone [7]. This, together with assessment of different ICT modalities based on experts' consultation and review of literature, could be basis for designing a comprehensive ACT-based education program that is applicable immediately for every teacher and learner irrespective of their age, gender and location to promote education for all.

This article is effort to examine ACT-based modalities on initiating the piloting the schools, student centric teaching and learning and the effects of COVID-19 on schools and universities on education. Based on the analysis of secondary sources/data and published news matters, the article reviews, national, international reports, books used to encapsulate the study. It highlights the challenges of the pandemic.

2. LITERATURE REVIEW

2.1 International efforts to manage the impact of COVID-19 on school education

Different nations have received a scope of measure to react to the pandemic relying upon their accessible assets. France, Italy, Germany, Australia, the UK and the US, have embraced separation learning as a way of making up for the trouble. They immediately improved their e-learning states to make normal separation learning focus entryways and gave understudies

access to e-substance and storehouse through cell phones. In these countries, all guardians, foundations, teachers have held hands together to make advance assets so that they could conveyed through virtual homerooms [5]. Similarly, the two most crowded nations like India and China, have both setup national e-learning gateways with access to the national vault of learning assets for guardians, instructors, understudies. China has adjusted adaptable internet instructing approaches to encourage learning. However, it has reinforced online security through the joint efforts of all specialist coops and made arrangement of psych-social help for guaranteeing 100% internet learning [5].

For illustration, in South American countries such as Argentina, Chile, and Brazil, where access to internet and internet connectivity is a major issue, and traditional technologies to deliver lessons and resources from a single, coordinated national education portal for students, teachers, managers, and parents. Radio, 3 television, YouTube channels, recorded lessons and digital educational resources/materials on demand are combined together to provide lessons to students who do not have reliable access to the internet [21]. Same way, Indonesia and Malaysia have mobilized all major technology providers, internet providers and TV communication channels to join hands of their ministries to provide live education programs for students as well as teachers. In Indonesia, Education TV, 'Learning House' and Online learning system program provide access to learning resources. Together, they provide "a learning management system as well as digital lessons, electronic textbooks and practice assessment tools aligned to the curriculum" Similarly, Malaysia has launched a new TV channel to deliver education through TV programs to all students, especially those without Internet access. These programs are also live-streamed on the Ministry's online learning platform which offers access to on-demand content as well as digital textbooks[21].

Radio, TV, YouTube channels, recorded exercises and computerized instructive materials on -request are joined together to give exercises to understudies who don't have solid access to the web. Likewise, Malaysia has propelled another TV channel to convey instruction through TV projects to all understudies, particularly those without Internet access. [6]. Our country Nepal has used Radio, TV channels and social medias like Viber, Whats App, Skype, Messenger for sharing educational materials in a students groups. ICT applications like Google Meet, Microsoft teams and Zoom also used to conduct online classes.

2.2 Impact of COVID-19 on education in Nepal

The huge impact of lockdown, schools and colleges in Nepal have been partially closed near about one year. After that second wave of COVID-19 has interred into Nepal very repeatedly. On account of the mandatory conclusion the schools and colleges for an impressive time frame, the instruction framework has changed significantly, with the unmistakable ascent of e-learning where by educating and learning is embraced remotely and on advanced stages. According to the record of Health and Population Ministry of Nepal, now, the third wave of COVID-19 is increasing day by day [4].

UNESCO (2020) estimates that '*nearly nine million (8,796,624) students in Nepal are affected due to school/university closures in response to the pandemic. Out of this number, 958, 127 (11%) are in pre-primary, 2,466,570 (28%) are in primary, 3,463,763 (39%) are in secondary and 404,718 (5%) are in tertiary education.'* The current situations showed that understudies in Nepal are influence distinctively by the pandemic. The study found that 56% of solidary individuals in Nepal approach the web. As indicated by Pandit (2020), just 13% schools may have the option to run online classes, however 35% schools approach the web.

2.3 Automatic Call Tree (ACT) Modality and COVID-19

The COVID-19 has made us think of an alternative way to teach our students, academician, institutions and teachers. Though, very few schools and universities have started to run online classes during this pandemic, and many of the students in Nepal are out of Internet access [19]. Automatic Call Tree Modality, an ICT based modality as initiative with the motive of connecting as much as interested schools, colleges and their respective students distributed geographically. The education in 21st century will progressively grasp on the ACT based modality of teaching and learning through the phone. The ongoing pandemic made an open door for the Nepalese learners to develop the human resources and ICT frameworks at school and colleges. As it isn't sure to what extent this pandemic will proceed, a slow joining of ACT-based modality of teaching and learning through the phones is the interest of the time [3].

3. Methodology

Automatic Call Tree (ACT) model was developed in Japan and it is successful model in developed countries like Nepal in present context. The Automatic Call Tree (ACT) model illustrated the whole procedure using via telephone or internet. Therefore, this methodology is used for effective communication and the exchange of teaching and learning materials and the conducting of required assessments. For any technical support, the particular IT officer troubleshot the generated technical issues. The telephone operator supports the communication among the teachers and learners, supports the continuation of the flow of the cycle.

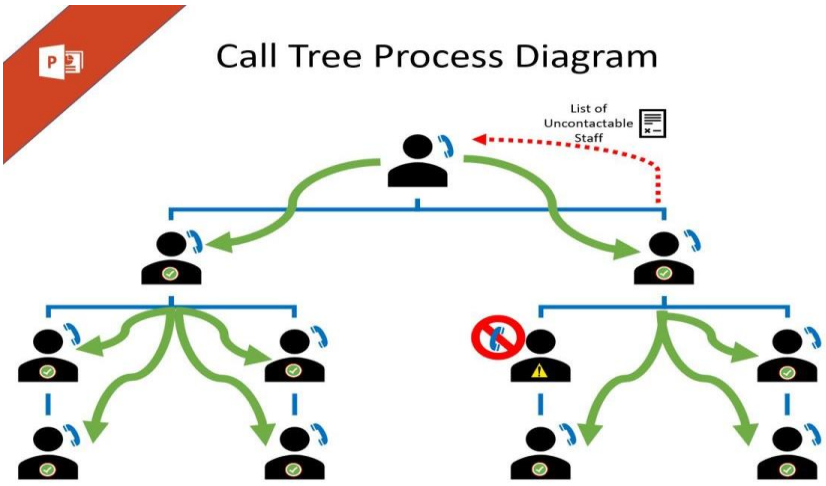
3.1 Automatic Call Tree (ACT)

Automatic Call Tree (ACT) is like a tree structure adjoining the learners by parents and further those students acts as parents adjoining remaining learners in a group until all the members join that tree in a logical manner. So, an automatic call tree model forms a tree of students in a class for establishing the connectivity among students and between teachers and concerned students for communication purposes. The group gets scattered geographically for the occupancy of their native locations for existence due to which they lose their connectivity with other members, with the reach of telecom services in very corner of the nation, the ACT facilitates with re-establishing the lost connectivity among the members of the group [3].

i. Automatic Call Tree Formation

This is a popular model which has been implemented in the closed school due to ongoing pandemic with the vision of establishing the lost connectivity among teachers and their students to transfoer reliable information to them. The teacher formulates a tree selecting 2-4 students both girl and boy from particular class and instruct them to transfer the teacher's phone number along with his/her message/study contents to transfer his/her remaining 2-4 selected classmates and further they instruct them to follow the same to remaining students in that class until all the students from that class receives the teacher's number and message/study contents and the cycle continues as show in figure 1.1.

Fig 1.1. Automatic Call Tree Formation



Source: Google

ii. Database Management and Monitoring

The instructor keeps the record of all students who are participated in class using database management system. The database includes the detailed information of the student, his/her phone number among with the alternate number, location, available timing, message transferred by their teacher and query raised by the students, assignments, short notices, news, etc. Teacher checks, manages, and updates the database in a regular manner in order to keep track of activities that are being carried out [17].

3.2 Conference Call Service

The conference call service has made easiness to connect groups of students and teachers at a time and transfer messengers and ACT-based content to students. The conference calls service facility is automatically activated during the purchase of postpaid plans and in case the service is not automatically activated, customer needs to fill up the service request form available at NTC/Ncell Office. The detailed information of standard charges including special packages can be accessed from NTC/Ncell application for by dialing *1415# for NTC and *17123# for Ncell [3].

3.3 Video Conference and Whatsapp Group Discussion

The COVID-19 pandemic from February to July 2020, the teaching and learning process in Nepal was conducted by using several learning platforms and communication devices, such as; Viber, Edmodo, Google Classroom, Moodle, Zoom Meeting, Microsoft Team and other Learning Management Systems. The institutions had fortunately implemented mixed learning long before the pandemic [13]. There are many technologies and applications used to carry out this project successfully such as Facebook, Whatsapp, web, phone tablet, PC and many more.

i. Zoom Video Conferencing

Zoom video conferencing is admired for its transmission, great HD video and sound and joint effort offices. Learners can likewise join a Zoom meeting without marking into the application, however, should pursue a record to have a video gathering. They can text talk and screen sharing. Zoom facilitates groups and associations to unite their organizations in a frictionless domain to complete more [5].

ii. Whatsapp Group Discussion Live/Chat

Many of students and teachers widely used WhatApp groups for chat and discussion with learners and such stakeholders. It is simply an American freeware, cross-platform messaging, and Voice overIP(VoIP) service owned by Facebook. The regular update of the program, sharing and verifying of the developed contents, news, instructions and essential links were shared in the group of WhatsApp [5].

3.4 ACT-based digital library

It is an extraordinary library with an attractive collection of computerized objects that can incorporate content, visual material, sound material, video material, put away as electronic media designs. The generated contents were than transferred to the students by the teachers involved in implementing ACT in school. Initially, the platform form for publishing online contents was set to Facebook, Google drive and WhatsApp, later on, the separate database was created.

3.5 Sampling strategy of schools for ACT Implementation and Execution

According to the Constitution of Nepal 2015, there are 7 provinces in the newly structured Federal Nepal. Each provinces consists of a number of community and institutional schools. Mountain, hill and terai are three broad ecological zones of Nepal. Each province consists of at least one eco-reason. Various schools exist in different ecological zones with distinctly different characteristics and features [3]. There are two types of schools in Nepal are i. Community schools and ii. Private schools which is elaborated in Table 1.

Table 1: Total Municipalities and Schools in Nepal.

Province	Ecological Zone	Urban	Rural	Community Schools	Institutional Schools	Total
Province 1	Mountain	49	88	5498	1232	6721
	Hill					
	Terai					
Province 2	Terai	77	49	3320	533	3853
Bagmati	Mountain	45	74	5243	2145	7388
	Hill					
	Terai					
Gandaki	Mountain	27	58	3772	835	4607
	Hill					
	Terai					
Lumbini	Hill	36	73	4629	1135	5764
	Terai					
Karnali	Mountain	25	54	3013	186	3199
	Hill					
Sudurpashchim	Mountain	34	54	3560	509	4069
	Hill					
	Terai					
		293	460	29035	6566	35601
Note: The urban is the sum of all three kinds of municipalities (Metropolitan city, Sub-Metropolitan city, and Municipality whereas the rural strata are the total numbers of Rural municipalities.						

Data Source: *NDRI Project Report 2020.*

4. Challenges

The online situation presents challenges for many academic staff and learners who increasingly require higher levels of technological competency and proficiency on top of their regular academic assignment [11]. The major issues related to ACT-based online learner, instructors, and content development. Learners' issues involved learners' potentials, readiness, identity, and participation in online courses. Instructors' issues involved altering faculty roles, transitioning from face-to-face to online, time management, and teaching methodology.

Content issues comprised the role of instructors in content development, mixing of multimedia in content, role of instructional strategies in content development, and attentions for content development. It is essential to address these challenges in ACT-based online education, need to provide professional development for trainers, trainings for learners, and technical support for content development. The institutions and staffs should be ICT friendly [12]. There are some challenges and limitations in the implementation of ACT-based modality in the schools. The major challenge is the issue of network and mobile balance in the students' and teachers' phone.

The other challenges:

i. Many of the schools at rural areas have been facing the network problems and limited balance in the cell phone of learners and teachers.
ii. Most of the students don't have their personal mobile phone, they couldn't join the class if their parents will out of home.
iii. It is difficult to solve the problems of mathematics, computer science, science, account, health and engineering subjects.
iv. Some parents were not to ready to provide cell phone to their child but some of them have lack of economic status too.
v. Due to the electricity discontinuity mobile phones couldn't fully charged so students couldn't attend full classes.
vi. Students and teachers could not get the teaching and learning material in time. Students especially in rural are facing this problems.

5. Result

In the context of COVID-19, student-centric teaching and learning was started immediately in five public schools of every seven provinces via mobile phone access. ACT-based modalities were established to initiate the piloting of 35 schools, 5 schools of both rural and urban areas from each province as an initiative to engage their students during the study. Approximately 85% of students from each school and 250 teachers were benefited from a series of events. The whole approach made the communication and exchange of teaching and learning materials effective. Time to Time Zoom meeting were conducted between teachers and management committee as well as students.

6. Discussion and Conclusions

The study has provided a situational analysis of education during the COVID-19 at schools and universities in Nepal. The COVID-19 pandemic has created some kind of educational disorder on the educational system in the globe. The pandemic has serious impacts on the teachers' and students' learning-teaching, family life as well social activities. It has huge gap between advantaged and disadvantaged children in their equitable access to quality education and access to technology. The proper actions is needed to continue the whole education system else it may be collapse at any time. Under the leadership of relevant ministry to explore possibilities a task force on education in each province needs to be set up in time. The study concludes that many of the students have not access to technology, some e-learning platforms are using by few learners those students who have access to technology. There is a vast gap in digital divide and technology access due to economic problem. Both public and private institutions have practiced different online learning-teaching system. But very few of them have got success on their profession. It concludes that the ACT-based modalities became fruitful for some schools of Nepal during COVID-19 pandemic. Its future is bright if could implement in our community schools, especially in rural areas of Nepal.

It is essential to improve education service platforms and mobilization of all service providers to combine the traditional technologies (radio, TV, landline phones) with mobile technologies to enhance the quality and quantity of the populations in education in the outlying parts of the country. Nepal Telecommunication initiated an ICT based solution to resume teaching and learning in public schools of every seven provinces of Nepal. The program integrated an efficient utilization of ICT as a method of gaining knowledge, achieving new information, and building capacities in public schools of Nepal.

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