To study the awareness about 5G networks and its impact on education sector with special reference to B-Tech & BCA students in SSIU, Gandhinagar.

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Abstract:

Purpose of Study: 5G technology will bring a technological revolution in telecommunication sector. It will give its impact on the all segments of life. It will transform the way of communication. The education is the most affected area in the revolution of 5G technology. Vast speed, higher connectivity ,higher bandwidth, lower battery consumption are the key features that would be got from 5G network system. Self paced learning, unlimited access, responsiveness are the benefits of the existing network system. To add more values and higher technology to the existing,it is the need of time to become more advanced and new modified technology.

Methodology: The methodology behind this study is primary data research with formation of questionnaire. This survey is based on the response by the students of BCA and B.Tech of Swarrnim Startup and Innovation University,Gandhinagar.

Main Findings: This research study found the awareness level of students regarding 5G technology and its impact on higher education.

Keywords: 5G network, Education, Awareness, Communication Technology

Introduction:

Today, in pandemic era, there are drastic changes in every field. Everyone is preferring for virtual platform. This preferred interest of people gave rise to develop the concepts to withstand in the competition. Already there is changes in technology to make update with the world. Previously it was the period of 4G network which is facing some challenges in speed, bandwidth, and high consumption of battery. But now the era of 5G network has been started. The combination of modern science and technology has made impossible things into real life.5G is the revolution in telecommunication industry. It's impact is seen everywhere. It affects all the fields. But it has highest impact on education sector. It has become necessary to study the impact of 5G network on education sector and to make aware the students to use for their learning purpose.

What is 5G network system? :

The word 5G technology denotes for 5th Generation of the Mobile Technology (MT). This MT has developed from the earlier period four decades starting from 1G (1st Generation), 2G (2nd Generation), 3G (3rd Generation), 4G (4th Generation) and now the expected 5G [1]. It is observed that how the revolution in telecommunication industry brought changes in human life.1st Generation network is being used for voice calls, 2nd Generation is used for SMS which was later improved to 2.5 to assist maintain browsing activities on the internet. 3rd Generation is for mobile television with Global Positioning System (GPS) and video conferencing which are all in use today. 4th Generation is an enhancement on 3G with extra services for higher data substitute. Long Term Evolution (LTE) is the standard for high speed wireless communication and improved the abilities of 4G with a higher downloading and uploading speed rates. The 5G MT will bring about a "Network Society" where many network technologies including Millimeter Wave (mmWave),Massive Multiple Input Multiple Output (mMiMo), Full Duplex, Cognitive Radio (CR) Technology, ZigBee, Bluetooth Low Energy (BLE) and Dynamic Spectrum Access (DSA) would be incorporated to provide improvement in terms of reliability, availability, flexibility, energy efficiency and low latency. These technologies are important requirements for advancements in Internet of Things (IoT) [2]

Review of Literature:

Delali Kwasi Dake1 , Ben Adjei Ofosu(2019), analyzed the impact of 5G technology on education in their research paper entitled, "5G Enabled Technologies for Smart Education ". In this paper researcher focused on educational users as beneficiaries of 5G technologies. 5G-enabled services can provide benefits to the modern day educational Institutions .The authors proposed frameworks relating 5G and its troublesome technologies in advancing tools that will boost the idea of a Smart Educational System. This paper hence provided a broad discussion on 5G technologies that will make possible new coaching and learning trends in Educational surroundings.

Federico Agnoletto, Senior Economist , "The Impacts of mmWave 5G in India October 2020", report reveals that over the period 2023–2040, we forecast that 5G technologies will make an overall contribution of approximately $450 billion to the Indian economy (0.6% of GDP by 2040). The manufacturing sector is set to benefit the most from 5G applications (accounting for 20% of the total benefit), followed by retail (12%) and ICT (11%)[4]

Saddam Hossain (2013), in his research paper he analyzed entitled , "5G Wireless Communication Systems" the great evolution of 1G (First Generation) to 4G(Fourth Generation) yield 5G,He also focused on the introduction to 5G technologies ,is it needed to go for 5G, what are the benefits of 5G networks technology, excellent applications, Quality of Service (QoS), 5G network architecture-The Master Core as well as hardware and software for the 5G MasterCore technology .[5]

Rupendra Nath Mitra∗ , Dharma P. Agrawal(2016),in their research paper has analyzed the recent development events towards 5G . This article provided a inclusive review of some current proposals toward a green, flexible, and mostly dominant 5G mobile communication standard.

Methodology:

Problem Statement

Due to speedy technological   developments the field of education is also affected. It brings changes

in education field as the flow of globalization changes. After pandemic situation E-learning is a phenomenon that hit the country's educational world. Due to heavy use of telecommunication technologies such as 5G communication ,it is imparting its impact on higher education field.

Objectives:

The objectives in this research are :

i. To study the awareness about 5G network system amongst the BCA / B.Tech students.
ii. To study the impact of 5G technology on education sector.
iii. To recognize challenges 5G in higher education.
iv. To analyze findings and provide suggestions for future research.

Data and Methodology:

The data is collected by primary data research method. The questionnaire is formed and distributed to BCA and B.Tech students in Swarrnim Start up and Innovation University ,at Gandhinagar. The respondents were from first year graduation courses from SSIU,Gandhinagar.The questionnaire is distributed to 150 students. The questionnaire was scrutinized and the authors got 100 respondents for analysis.

Results :

The respondents were submitted the questionnaire to the authors and the authors done analysis with the help of SPSS software. The results has shown that 74% students are aware about 5G technology. The 59 % students from BCA and B. Tech has no devices for enabling 5G network system.57% percent students agreed that they does not have 5G network area. Only 16%students are agreed that they got the speed, self paced learning, responsiveness and unlimited access from the existing network. 51% students responded positively for enhanced network coverage. 54% students reveals that University campus is not providing WI-FI campus.44% students think that there will be more battery consumption with 5G network. Call drop is the major problem with the existing 4G technology. And 29% assumed that connectivity is the second major problem faced by current mobile technology. 38% students are unaware about the bandwidth concept.28% students accepted the benefits from 5G technology such as a)High-Speed b) Faster uploading c) Faster downloading d) Higher Network coverage e) less battery consumption 52% students accepted that there will be positive impact of 5G technology in education field.39% students denied that 5G network overcome the problems network and interruption in their online learning.50% students agreed that 5G network will increase the speed of their learning.41% students shared their views that as compared to advantages 5G network speed can distract them from learning to other useless time consuming activities on social media.

Discussion:

The use of 5G technology impacts positively on education sector. Due to implementation of 5G it is possible to upgrade higher education with latest technology.5G technology will offer high speed, more accessibility, and more learning engagement environment. Due to Covid -19 pandemic situation ,it is need of online education to the students.It involves live streaming,online videos,online sessions/lectures. It will require higher connectivity of internet. It's possible only through fastest network connectivity of internet.With high speed of internet ,students can get their online sessions according to their comfort and location. It will provide the flexibility and adaptability in their education. Though it is having more benefits ,it also faces some challenges like to reduce Interference, latency, power consumption, and enhance data rate.

Conclusion:

It is concluded from the above facts and figures the information we get is that there is something big is going to happen in the upcoming future and many sectors are going to be affected. There are various sectors in which 5G technology is applicable as the application says, the one sector is discussed in this paper is education with special reference to BCA and B.Tech students in SSIU, Gandhinagar. The awareness regarding 5G technology among the respondents is not as much as expected. Also it is concluded that there are challenges to install the 5G technology in

the existing devices.There is also need to set up the connectivity for 5G connections.The students should need upgrades themselves regarding 5G technology. With their knowledge only ,5G technology could be better applicable.

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