Boosting Education Through Mobile Technology in India - Study with Reference to Generation Z

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ABSTRACT

Twenty-first century recognize the younger generation as Gen Z that is mobile first generation who live-in the virtual world in par with reality through extensive usage of smartphones & related gadgets. The usage of Mobile Technology in the education sector has become the need of the day. Students have started relying on mobiles for information, surfing the net, chatting, using applications and connecting to social media like WhatsApp, Facebook, Instagram, Twitter, Viber, etc. The usage of mobile technology depends on the emerging need for the advancement of education and student behavioural patterns. In the competitive era, the accomplishment of extensive learning goals is possible only by the adaptation of new teaching pedagogies. The educational institutions have started encouraging teaching and learning pedagogies which are suitable to Gen Z along with regimented chalk and talk method. Schools have started using applications to compete with the current style of education. Information Technology has changed the world into Gen Z where people think, senses and use information through technology. This study aims to evaluate the utilization of mobile technology in classroom teaching, analyze the impact of technology towards enriching the learning abilities of the students, to explore new pedagogies suitable for learning and teaching. This paper suggests measures to teaching fraternity to improve the pattern of educational delivery by introducing innovative and advanced techniques of mobile technologies.

Keywords: Virtual world, Mobile technology, Classroom teaching, Teaching pedagogy.

1. INTRODUCTION :

The use of the Internet is critical in education, as it provides direct access to information available worldwide. The plenty of information available through internet resources is causing conventional learning and teaching procedures to change. All teachers and students have direct access to virtually all subject material. The rapid development and accessibility of internet resources to learn in a virtual environment lead students and teachers in the process of learning and teaching to adopt new technologies and techniques. Students collect and use mobile telephones in learning processes in many classrooms at all colleges and universities. It is understandable that during learning processes in classrooms learners can use the technology for information purposes. This study aims to understand student behaviours constrained to the classroom learning phenomena. It is interesting to learn that the use of mobile devices and applications in social networking influences the learning process of students [1]. Many research works have reported that Teaching could be highly impacted by the effective utilization of mobile technologies. Mobile technology could be used to gather information from the internet for efficiency and effectiveness. Audio of the classroom sessions can be recorded with the help of mobile technology which facilitates for free listening to the past lecture without any problem. The instructional lectures can be stored which allows students to learn better by listening to it any number of times. Mobile technology is a great tool when classroom intensity is high for live polling. This helps teachers understand the thinking of the student, and this process can provide effective teaching. Online

teaching takes place in a manner that allows a student to access learning materials and programs using a mobile device such as smartphones, new notebooks, or handheld gaming equipment [2]. The fast growth of mobile phones has facilitated the adoption and implementation of mobile technology by higher educational institutions. It can also use mobile devices and programs to make way for reading. Innovative methods and techniques aiding learning and teaching pedagogies for the distance learning students are the need of the day which could be met through mobile learning technologies. In the interest of student security, mobile learning brings the teacher, students and resources to the virtual platform at interim levels even with indirect supervision models. Over recent years, the usage of mobile devices has increased explosively. Looking at several currently deployed and evaluated mobile apps, m-learning can significantly supply e-learning by creating an additional access channel for e-learning.The students of Generation Z will demand an atmosphere in which they can engage with their virtual world in a similar way. This suggests a need for instant information, visual ways of learning, and the replacement of "communication" with "interaction" that "there is a need to explore and appreciate the elements of technology, social media and social networking that students find so compelling and integrate these elements into teaching and learning." This does not only include the convergence of software and advances in technology, and social media can further boost this acceptance of teaching and learning education [3].

2. SCOPE&LIMITATION OF THE STUDY :

The study enables educators to identify, adopt and implement modern methods of teaching, effective techniques of classroom delivery and coordinate the use of Information Technology. Student actions can be better understood by reviewing the influence imposed by the technology and information systems over the learning aspects of the students. The significance of this study is limited to the exploration of information technology into the learning environment of the students. In the context of academic and educational exploration, the study describes the utilities of mobile technology within classroom education. Research offers the opportunity to understand student'sbehaviour and their relationship with technology during teaching and education from a social point of view. The possible limitations of this research could be the time and available resources [4]. The scientific credibility is established in this study by suggesting measures to balance the effective usage of mobile technology along with other new teaching techniques to meet the educational goals [5].

3. ADOPTION OF MOBILE TECHNOLOGY :

Adoption of Mobile Technology in education cannot be carried in one step but requires completion of mandatory levels so as to create scope for the further steps as explained below :

(a)Educational Objectives: Education goals describe the aims of the education process, the learning resulting from training. Once defined by an academic authority or a business organization, goals are usually referred to as standards. Instructional objectives define the goals that the instructional process is aimed at–the learning that will result from instruction [7].

(b)Teaching Strategy: It facilitates the learners to understand the concepts provided under the curriculum of the course under study in order to achieve the learning outcomes aimed through such teaching processes. Teaching strategies identify variouslearning methods which allow them to develop the right strategy to deal with the identified target group [6]. The course content shall be instructed to the students by building intrinsic desire among them to achieve the predetermined outcomes of such a study at the end of the course sought. The methods of role play, discussions, forum activities, group works, presentations, assignment writing, project work, debate, interactions, visits, expos, exhibitions can be best used to addressing the needs of the target audience.

(c) Techniques: Mobile Technology in Classroom learning allows mobile devices to be used inside the classroom is still a debatable issue surrounding schools in the Philippines today. School administrators, faculty as well as parents opposed the idea of utilizing mobile devices in the classroom. Though, some schools do allow their students to use this provided that it will be used for instructional purposes only. Students today have their own ways of learning using technology [13]. Taking notes to create their own digital magazines is their own way of dealing with lessons. Major adjustments must be made by teachers who are non-digital natives. Efforts must be exercised to come up with the demands of time. We can never come back but instead look forward and look for other opportunities' technology could

offer. The exhaustive dependability over mobile technologies by children has drastically increased their habits of texting, twitting, voice messaging, etc. The educational institutions shall utilize the tech friendliness of the younger generation in education to derive the best result (Figure1).

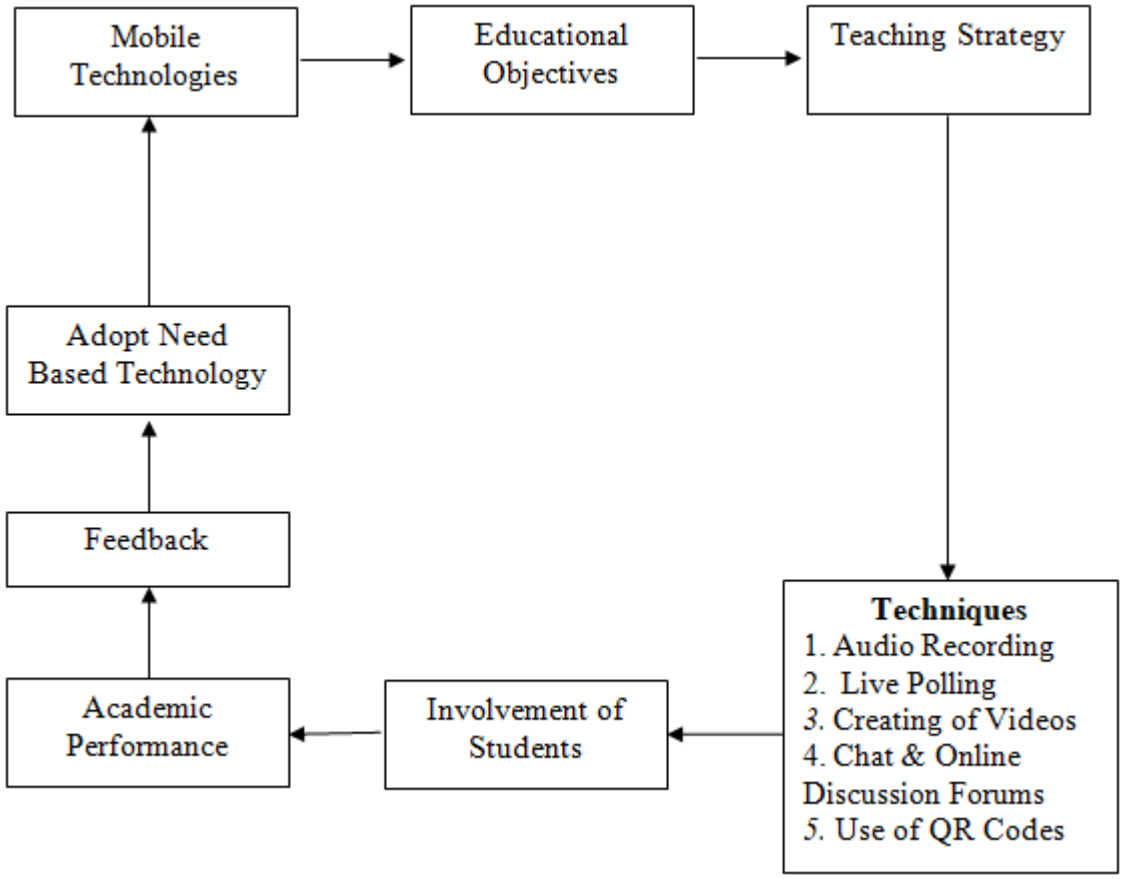

Figure 1: Adoption of Mobile Technology in Education

The mobile technologies can be best utilized for achieving critical thinking abilities, linguistic literacy, numeric skills, calculation, application of technologies, scientific inquiries, creativity, critical thinking, aptitude, application, etc. Mobile learning applications are using standard features inbuilt in the mobile system or innovative features created through special software programmed on special purpose [14]. Since technology is the practical phase of scientific inquiries which could be adopted in teaching and learning based on customized needs. The mobile technology with complete customization allows the user to choose courses, pedagogies, evaluation, and examination in accordance to his interest and time which obviously provides good end result

(i)Use of Audio Recording Feature: Students most probably expect feedback from the teachers on their performance which they consider to be very conservative and of very high quality. The Smartphone having the facility of audio recording can be used by the teachers as a tool to provide personal feedback by using voice message services [8]. Research showed that students not only appreciated but even welcomed, input from this way.

(ii) **Live Polling Tools**: Online interactive polling tools can be used in a classroom to perform a formative assessment with the help of welcome and exit cards. This is a free method used to evaluate the knowledge of the students to plan for future courses of action [9]. This method provides information on the abilities and deficiencies of the individual student to plan for customized instruction modules.

(iii)Creating Videos: The students could be assigned with the task of producing a video clip of less than five minutes or even voice recording on their understandings after the detailed lecture on a particular topic of study. This will provide more opportunity and encourage creativity instead of making them to write an assignment of 2000 words, where normally students either produce just by copying

from some published works without understanding the subject [10].

(iv) Chat and Online Discussion Forums: The mass online open courses provide ample opportunity for the students to register for free courses online so as to engage themselves in the discussions forums of experts to discuss and clear the doubts on any topic under discussion. Even these platforms are optimized to mobile systems helping every student to participate in the discussions from any place without depending only on the institutional computer labs or audio-visual classrooms specially constituted to such purposes. Students can freely express their opinion with or without consulting the teacher on any subject in which he has expertise in the evening or on holidays [11].

(v)Use of QR Codes: Another great way of using mobile technology in the classroom is through Quick Response codes (QR)to build a network of resources, complex diagrams and pictures making it available to many students. This technique provides ample opportunity for both student and teaching community to utilise mobile technology to bring change in the classroom teaching process. Always usage of technology carries more utility than the normal work since it enrichesthe quality of service delivery and efficiency to provide greater productivity at the end [12].

(vi)Mobile Application: Mobile apps attempt to make learning fun by making it easy to access information. Mobile apps and apprenticeship management systems have provided a sustainable way to create educational courses, free education, facilitate teacher-student-parent cooperation, improve student engagement and provide an array of options.

(vii)Online Education Portals: Indian education is the most famous education portals. Net is a network of 48 portals linking one of the largest online learning web sites in India, Khan Academy, Coursera, EdX, W3 University, Earth, Byju's, Smart Class. etc.

(viii)Smart Class: The Smart Class offers a solution for teachers to new needs and to improve their students ' skills and performance. It enables teachers to use more effectively for teaching student's multimedia content and information. Smart Class gives students the opportunity to learn the concepts.

(ix)Audio-Visual Aids: Audio-visual services are tools used in the classroom for teaching promotion and facilitation. The best tool for effective training and the best distribution of information is audio-visual aid. Audio-visual aid [15][16] is the best tool to make education efficient and the best diffuse.

(d)Students Involvement: Student participation in education refers to students ' grades of attention, curiosity, interest, excitement, and passion which relate to the level of motivation and progress they are required to learn. The definition of student engagement is usually based on the belief that learning increases when students are inquiring, involved, or motivated and that learning fails to get bored, disaffected or otherwise "disengaged." In this sense, students are not engaged.

(e)Academic Performance: Academic success is the extent to which a student, educator or organization has accomplished short or long-term academic goals. A cumulative GPA is academic achievement and benchmarks such as secondary and bachelor degree programs.

(f) Feedback: Teachers and parents shall collect feedback on the efficacy of mobile learning on student achievement. Since mobile learning is not a standalone activity in processes of teaching and learning it is difficult for the teachers to assess the exact impact of usage of mobile in learning. The possible deficiencies are noted to make the required change to enrich student achievement and suggesting management about need based techniques to enhance student success in the near future.

4. CHALLENGES FACED BY MOBILE TECHNLOGY :

Even though the teaching and learning processes can be highly influenced through the usage of Mobile Technology it carries few limitations with it as listed below.

(a) Psychological Strain: Mobile devices facilitate immoral student behaviour, it disrupts young minds from the course of study towards the virtual world, hinders interpersonal ties and reduces concentration in studies. Youngsters are investing more time every day in surfing the internet which causes damage to the eyesight causing stress.

(b) Risk of Distraction: Students spending more time on mobile is highly condemned by the elderly community to be a bad habit. Parents are put to worry about obscene sites which prone young mind into adult contents leading to internet addiction. The educators shall assure the usage of mobile devices for learning, restraining the learning from using it for the purposes of chatting, surfing videos, playing games, watching pornography and connecting with social media in the learning hours.

(c) Theory of Learning: In spite of several theories onlearning through mobile technology, each theory

speaks in different terms and it is very difficult to find theory having universal acceptability. One theory proposes mobile learning to be distinctive from laptop learning due to its handiness, compactness and mobility features. John Traxler &Marguerite Koole demand for formulation of new theory applicable to the whole mobile learning community either by importing one from conventional e-learning and applying it to mobile learning aspects or developing a new one suitable to cultural and economic aspects or even subscribing to the most acceptable theories after scrutinizing its practical applicability to the mobile technology platforms [23].

(d) Product Differentiation: It is a business strategy to retain the uniqueness of mobile devices to compete in the market in the name of product price, appearance, style, and differences in display, resolution, RAM, Storage, camera, battery, weight, dimension, scanners, modular attachments, audio, video, connectivity, etc. Differentiation is also related to compatibility with new applications hence creates a challenge of learning new operating systems and related investment of cost and time [24].

(e) Other Limitations: Typing huge materials in mobile is a challenge due to the absence of a compatible keyboard which hindrance against active participation on discussion forums by using mobile technology [17]. Developing study notes compatible with mobile devices confirming to varied standards, product differentiation, and operating systems is a big challenge. The threats on the safety and privacy of the mobile users in terms of personal data, parents, academic credentials and professional data shall be upheld without any compromises. The problems with internet connectivity and battery backup with sufficient recharge points or power bank shall be ensured in the classrooms.

5. OPPORTUNITIES FOR THE USAGE OF MOBILE TECHNOLOGIES :

The possibilities of embracing and using mobile technology in education mentioned below are many in the future.

(a) Mobile Technology in Classroom: Since students are very much interested to use mobile phones in the classroom, the teachers can also introduce a new method of learning by effective adoption of mobile technology in the classroom to surf necessary information connected to the topic under discussion. Both teaching and learning can be made interesting by connecting students to some online videos, materials, blogs, research publications, books related to the subject and learning will also improve if students understand how to engage in selective learning for their betterment.

(b)Improvising Engagement: After the inception of technology into classroom teaching, students shall be encouraged to carry the participatory form of education. Technology provides several opportunities to learn things by using pictures, videos, published materials, animations, documentaries with more enjoyable and interesting ways. For example, teaching through augmented reality, virtual reality for teaching subjects related to human anatomy, business, chemistry, physics, etc encourage students to understand the subject very easily. In traditional teaching pedagogy, engaging students is tougher when compared to technology aided education where learning becomes fun for the learners.

(c) Retention of Knowledge: Interest of the students on the subject and their participation highly influence their learning abilities. Those who actively participate in the learning process understand the practicality of the subject will earn greater retention on the subject learned. Since technology encourages student participation, it will play a vital role in the retention of information. The testing and determining which methods work best for students in terms of retention of their information can be achieved with different forms of technology [17].

(d)Encourages Individual Learning: Due to the different types and skills of learning, nobody learns the same. Technology provides everyone with various needs great opportunities for learning. For instance, students can learn at their own pace, review difficult concepts, or skip if appropriate. Moreover, technology will give students with difficulties or disabilities more opportunities. Internet connectivity works as a gold mine of information for the students with a wide range of learning resources which creates curiosity among the students in choosing the most appropriate through researching on the varied literature.

(e)Encourages Collaboration: Through engaging in different online events, students can learn teamwork skills. For instance, via forums or document sharing, working on various projects in cooperation with others. Technology may facilitate teamwork through Internet connectivity with students in the same classroom, school, and even other classrooms.

(**f)Teaching Life Skills through Technology:** Through teacher and student strategies in the classroom,

the abilities necessary for the 21st century can be established. In the future, students will learn the skills they need. Collaborating with others is modern learning, addressing complex issues, critical thinking, improving new forms of communication and leadership skills, inspiration and efficiency. In addition, technology can contribute to the development of many practical skills, including presentation, learning to differentiate between credible sources on the Internet and maintaining proper etiquette online and writing the e-mail. These skills are very relevant and can be built in the classroom**.**

(g)Benefits the Teacher: Technology can help teachers to improve their teaching with numerous online resources. They can rely on varied applications or online consortiums to collect the most recent and updated information to teach super specialty subjects to produce more trained students who are employable. The instructor can save a lot of time from virtual lesson plans, electronic testing, and online tests. Nearly all programs allow individual training. According to their skills and needs, students will learn[18]. This kind of teaching is perfect for the teacher as it gives him/her the time to work with people in difficulty. More time can be spent on slow learners to orient them consistently with the aid of technology**.**

(h)Content of Learning: Today, many teachers face a question about whether or not mobile devices are incorporated into their classes. It is well known that our students already use mobile phones for personal use or work at school today. Teachers must do more to ensure that students remain interested in the lesson given the many challenges facing them today. The impact on mobile device use in a classroom can differ according to the way students use it. We need to take into account new possibilities.Teachers will gain valuable insights into their students ' skills and the success of their preparation in real-time. It is time for us in the classroom to take on a new revolution. On the other side, students should obtain positive results. The best options for the introduction of mobile devices into education and learning will support many ways to improve the academic performance of students[20].

(i) Efficiency &Effectiveness: Lecturers can prepare and upload study materials on a pre-determined curriculum through the help of a learning management system so as to allow the students to download the materials throughout the year of study instead of providing hard copy to each student. Without spending a huge amount of money to photocopy the study materials students can access to such materials through their Smartphones free of charge from anywhere even while at the bed. Adoption of technology makes many students and teachers to be tech-savvy but many do not understand the subject semantically. Technology provides an entirely new chance to do things in a creative way. To make our research work efficient, achieve high performances the innovative features of mobile technology shall be creatively implemented. Students should also learn to make the best use of these innovations to enrich their knowledge [21].

(j) Mobile as Communication and Computation Device: Mobile devices used in education applications have two basic technologies in them that includeelectronic communication and electronic computation. These two basic technologies called general purpose technologies to support all educational features using mobile devices for information generation, processing, storing, retrieving, and communication in the education industry[25].

(k) Supports as Platform for ICCT underlying Technologies : The basic technologies – information communication technology and information computation technology are now combinedly considered as Information Communication and Computation Technology (ICCT) and many sub-technologies are developed under them and are called ICCT underlying technologies. These ICCT underlying technologies include Artificial intelligence & machine learning, Big data & business analytics, Blockchain technology, Cloud computing technology, Cyber-security technology, 3D printing technology, Internet of Things (IoT) technology, Information Storage technology, Mobile business & marketing technology, Online ubiquitous education technology, Optical & Quantum computing technology, and Virtual & Augmented Reality technology. These ICCT underlying technologies support the education industry including teaching-learning processes through a concept of mass-customization [26], [27].

6. FUTURE IS MOBILE :

It is expected that the future education will not remain constrained to Campus rather transforms itself to be a lifelong engagement carried through mobile technologies for competency and employment. Gradually education gets migrated to mobile as the banking and payments were now carried through

mobile phones in both Asia and Africa. Exploring mobile learning in the present day makes good sense in achieving fullest mobility. Lots of research is carried outto increase the utility of mobile education technologies. For instance, cell phones which were once expensiveare provided with GPS technology, free Software Applications, Touch screen, high definition Cameras, Internet facility, MS Office, etc. [18]. Educators should explore the effective usage of these facilities in classroom learning.

(a) The transformation of the education system from the campus to mobile is the need of the day. In this regard, students at the postgraduate levels can be encouraged to initiate start-ups developing mobile learning platforms to deliver mobile based online education.

(b) Private and public funding can be boosted to enhance the adoption, usage, and development of mobile learning to achieve the best transformational goals.

(c) Educators should develop live education videos with the help of technology to reach masses who really desire to study. The development of mobile learning consortiums, blogs is the stepping stone towards massive online education.

(d) Educators, Institutions, Policymakers shall encourage the student community to use mobile technology in the classroom.

(e) Training Educators through bridge courses, crash courses, faculty development programmes to enable them to learn using mobile platforms for effective classroom teaching shall be further enhanced by the Ministry of Human Resource Development, Government of India.

(f) Educators must seek National support for the adoption of mobile technology in educational institutions of the country. With the conclusion of discussion on utilities of mobile devices in classrooms, educators should focus on the best usage of it [19].

7. CONCLUSION :

The use of mobile technology increases student academic performance. Curriculum planned by the Universities in the 21st Century shall always refer to the best usage of mobile technology in achieving learning outcomes of each subject taught in the academic year. Younger generation if allowed to use mobile devices inside the classroom, they cannot be made exclusively using it for education but educators should orient students in such a way to make the best use of their mobile handsets for learning better. The scrutiny on the learning standard of the students using mobile technology is essential to impart training in building their competency. Draft on National Policy on Education, 2019envisaged to empower every learner to contribute to the growing imperatives of the country in the interest of constituting just and equitable society. Dr. K. Kasturirangan's committee proposed for upgrading education, legislation, and governance in the interest of upholding Indian values systems compatible with the expectations with the present century [28]. Finally, it can be concluded that using mobile technology in classroom learning will make students act smart in all stages [20]. The journey of learning by using mobile technology has just started and it is the educators who should achieve the credibility and authenticity of it.

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