

Use of Information and Communication Technology for Quality Education

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Abstract

Sustainable Development Goals (SDGs) aim to attain a better and viable future for everyone and the world. Quality education is one of the SD goals vital for nation-building and equalising with other countries. Technology plays a significant part in education as it enhances the quality of education when integrating Information and Communication Technologies in the education system, predominantly in the teaching and learning process synchronously or asynchronously. It helps to attain the teaching-learning goals, enriches access and availability of resources, builds capacities, and manages the educational system. It improves flexibility, where students and teachers can access teaching and learn anywhere without geographical barriers. It also expands access to education, raises academic quality, and helps teaching-learning engage. The present study aims to determine the role of ICT in improving the quality of education and how its usage can be enhanced in the education system. The study materials will be gathered through the interdisciplinary literature review method. However, to make it possible, there are roles to be exercised by the government, education management, teachers, and students.

Keywords: Sustainable Development Goals, Quality Education, Information and Communication Technology

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Introduction

The United Nations established a sustainable development goal (SDGs) in Brazil in 2012 at a conference on the topic of Sustainable Development which has 17 goals to attain a better and viable future for all people and the world. Among the goals, Quality Education is one of the most important goals that urgently need to focus on. All levels of education are equally essential to achieve the SD to eradicate poverty, attain gender equality, women's empowerment, and, most importantly, for human development (United Nations, 2012). It enables people to bring out or develop all their potential and skills to become beneficial to human beings and society. Education aims to make good human beings efficient in reasoning with action, acquiring a spirit of boldness or courage, loving and kindness towards fellow beings, creativity, and possessing moral values (NEP, 2020). For improving the quality of education, some factors are responsible. We need quality education to build a better nation and equal position with other countries. Creating a quality education requires cooperation between the government, society, and the private sector to support each other (Mou, 2016; Pramana et al., 2021). Furthermore, information and communication technologies play a significant role in this technological era, particularly in the field of education, to make the learners learn better, acquire higher-thinking levels, make it more enjoyable and effective, and produce quality human resources (Akilbekovna, 2021; Al-Rahmi et al., 2020). Therefore, the present study is to find how technologies (ICTs) are used in teaching-learning process particularly in India to enhance the quality of education.

Concept of Sustainable Development Goals

Sustainable Development examines the different needs towards the responsiveness of our environment, society, and economy of our planet. It is an effective approach as it focuses on recovering or progressing human-environment interaction by highlighting the management and preserving our world resources for the future (Willsher, 2022). Sustainable development is an approach to seeing the needs of the present generations without affecting or disturbing the needs of future generations (Global Environmental Health and Sustainable Development, 2022). Sustainable development has existed in indigenous values for years, although the term itself is relatively new (Agbedahin, 2019). Quality education is one of the sustainable development goals that call for all the education stakeholders to encourage and promote education by providing adequate facilities for all children irrespective of gender and health and providing safe and effective learning environments. ICT in education can improve and renovate the education system, thus making a nation reach a higher level (Yuchi & Zhujun, 2018). Moreover, the United Nations aims to realise quality education by enhancing teacher training, developing sustainability curricula, teacher training programmes that prepare students for careers in sustainability-related fields, and more effective use of information and communications technologies to enhance learning outcomes (United Nations, 2012).

Concept of Quality Education

In 2012, at Rio De Janeiro, a conference organised by United Nations on Sustainable Development, a document with seventeen sustainable development goals were adopted. By then, quality education was recognised as an essential element for sustainable development for the first time (United Nations, 2012). Moreover, in September 2015, the UN adopted 2030 Agenda for Sustainable Development with 17 goals. The world is putting education a priority to bring development and sustainable development. So, significant steps have been taken by the United Nations toward education by including in the SDGs to be achieved in 2030

(UNDP, 2015). Quality education is one of the 17 Sustainable development goals aimed at ensuring that all get equal education irrespective of caste, race, gender, or challenges providing opportunities for everyone (Rulandari, 2021). It is an essential weapon for achieving a sustainable future and aims to increase education access, particularly for girls and marginalised groups. Another aim of this goal is to achieve universal education. It also facilitates people to progress their skills and advance their potential as abled human beings that can contribute to and benefit society. Quality education provides the foundation for societal equity (Goldhaber, 2021). This quality education begins with improving the learning process that leads to independent learning for students and is no longer teacher-centred (Pramana et al., 2021).

Education is a foundation for peaceful societies and effective institutions. Building the knowledge to tackle critical challenges like climate change is essential. Attending school is never enough if children are not learning. Therefore, quality education is required for youth to get employment in a high-profile job, and it is necessary to be digitally literate, especially in this technological age where almost every work is done with the help of technology. Moreover, the educational system is the area that needs to focus on and how learning systems match with constantly changing demands (United Nations, 2019).

Concept of Information and Communication Technology

Information and communications technology cover all appliances and network mechanisms and applications, allowing people to be involved in communications, media, creating management systems, and audiovisual and network-based supervising. In a broader term, ICT refers to all technologies, such as computers, software, the internet, wireless networks, social media, cellphones, video-conferencing, and other facilities. It also includes resources, content, forums, and services that can be provided via digital forms. It can be utilised to realise teaching-learning goals, enhance access to learning and availability of resources, and manage the education system systematically (Agarwal et al., 2018; Mahashevta, 2017; *National Policy on Information and Communication Technology (ICT) In School Education Department of School Education and Literacy Ministry of Human Resource Development Government of India Contents*, 2012). Information and communication technology have done an extraordinary task for inclusion and overcoming the challenges to meet sustainable development. Technologies greatly help scientists, activists, technologists, educationists, and others with network collaboration, problem-solving, and discussions. The progress of sustainability can be realised through ICT, which assists the world's educational institutions, organisations, government and nongovernment, and all the people to become professionals and leaders to solve the problems of this generation (Sachs, 2012). Sustainable development goal number four- quality education aims to make a learner develop knowledge and skills which will back the sustainable development to protect our environment and make our world a better place now and for future generations (Wang et al., 2021).

Importance of Information and Communication Technology for Quality Education

Information and Communication Technology are commonly used in teaching-learning to strengthen students' learning experience, online learning, and evaluation, to increase the quality of knowledge delivery. It also promotes deeper understanding to develop personalised competencies and acquire knowledge and information (George et al., 2021). Moreover, the ICTs and the internet have an excellent advantage in enhancing traditional learning and act as a catalyst to change the teaching-learning approach. Appropriate ICT implementation

improves education quality and promotes educational equity in developing countries (OECD, 2016; Yuchi & Zhujun, 2018). Delivery through PowerPoint presentation, smart classroom develops interest and curiosity among students making the content easy to understand, and fulfill the needs of the learners. The use of ICT in the classroom makes the teachers easy to get the attention of students while delivering, making the teaching-learning process effective, productive and easy (S. Sharma, 2018). In addition, it encourages learning through participation, engagement, productive learning outcomes, and adopting the best teaching method. It also serves as a channel to build a social network for students and teachers to support and exchange knowledge within the institutions and share, learn, and support globally (Sobaih et al., 2022).

ICT employs for achieving educational goals and improving flexibility, where students and teachers can access teaching and learn anywhere without geographical barriers. It also expands access to education, raises academic quality, and helps teaching-learning engage (Bindu, 2017; U, Wilfred-bonse, Kate. E, Itodo. & A, 2020). Realising the weightage of technology use in the education system, the National Policy on Education 1992 emphasised the necessity to use technology in education to progress the quality of the Indian education system. Again, the National Curriculum Framework (2005) also suggested using ICT effectively in classrooms to develop critical thinking and the ability to solve problems amongst 21st-century learners. ICT empowers teaching and learning by incorporating different technique, methods and tools and also provide rich resources to enhance quality outcomes (National Curriculum Framework, 2005). The National Policy act as a blueprint for adopting and implementing educational technology in schools by emphasising the state's role in providing students and teachers with equitable and universal education and ICT-enabled resources (Maitra & Anurekha, 2021). Furthermore, the National Education Policy 2020 stresses digital literacy and ICT applications in teaching-learning to enable all children to get quality education and reach out even to the remotest places of the country. Such programmes are SWAYAM, SWAYAMPRAVA, e-pathshala, NROER, NDL, Digital India Campaign, and many others (Parida & Rout, 2021).

There are different ways of using ICT in teaching and learning. People learn from YouTube, and other social media as learning from ICTs or social media is more fun and convenient than sitting in the classroom and listening to lectures. Coursera, YouTube, WhatsApp, and Facebook are commonly used for asynchronous learning in India. While online platforms like Google Hangout, MS Teams, WebEx and Zooms are widely used for synchronous learning. Integration of ICT in education became popularised after the eruption of the Covid-19 pandemic when online learning and hybrid learning started to be adopted (Allen, 2019; Panigrahi & Dwivedi, 2021; Umare et al., 2022).

Moreover, WhatsApp is the easiest and most convenient way of linking and interchanging in a group through sharing and conversation. People feel more comfortable using English while interacting on social media, which helps them improve their skills in English (Rezaul Karim et al., 2022). Therefore, the use of the internet in language learning, mainly English language, is rapidly growing, opening up new and exciting opportunities for English Second Language classes. A weblog is another helpful appliance or tool for language learners to develop writing skills (Perumal & I, 2022). For young and adult learners, Gamification in Education is one of the most exciting, motivating, and fun approaches to learning using ICTs. It includes features such as discounts, badges and leaderboards to show the top performers, making teaching-learning more effective, enjoyable, competitive, and rewarding for academic students and professionals (Panigrahi & Dwivedi, 2021). In addition to that, Moreover, while

adopting an online or hybrid learning approach, Quizizz media is an effective method that motivates students to discover their abilities and understand what the teachers lecture or explain. It acts as a self-evaluation instrument that encourages the students to be attentive and work hard to get satisfactory learning outcomes on the test, making the learning process more exciting. It builds interest in learning (Henukh et al., 2022).

However, to be successful in using ICT for quality education, adequate infrastructure, human resources, and efficient leaders are highly required for effective and satisfactory classroom and online learning results (Wang et al., 2021). To reap the enormous advantages of ICT in education, there is a need to train teachers or lecturers on the basic skills of ICT to ensure their competency and possess educational institutions well equipped with ICT facilities (Imam & Andrew, 2016). Education becomes an agent for the community's social power to apply a method of fostering the people to adapt to the demands of the times. Globalisation is possible through ICT as it has brought unexpected changes regarding new values, perspectives, and the entire spectrum of human life. The role of technology, the community's professional and skilled human resources, and open, democratic, humanist, and progressive social order are the qualities that must possess to survive and face the unpredictable future (Rulandari, 2021).

In 2020, when Covid-19 hit the world, education was among the most critical factors greatly affected. The majority of the countries announced the temporary closure of schools, impacting the lives of students worldwide. The importance of technology became more intense or visible after the outbreak of the Coronavirus pandemic (Di Pietro et al., 2020). Therefore, the UNESCO 2021 rightly stated;

One silver lining of the COVID-19 pandemic is that it clearly showed that change in education is not always bad; classroom disruption can lead to classroom innovation. It is necessary to agree on the right route to ensure that all education is inclusive, equitable, and of high quality. (Fengchun & Wayne, 2021)

Discussion

Quality Education is included among the sustainable development goals as its importance has reached paramount in today's world. The main aim of quality education is to prepare students for life, life skill, and solve life's problems. The reviews clearly show that the use of information and communication technology in education enhances learning outcomes thereby, improves the quality of education. ICT is used in education as an interactive process integrating in the teaching-learning process simultaneously or it could be used asynchronously and synchronously. Access to education anywhere, breaking the barriers, and getting the opportunity to spread education to a large extent are made possible through the integration of ICT. It also helps teaching-learning interactive, engaging, exciting, and most importantly, it shifts from teacher-centred learning to student-centred learning. Additionally, the universalisation of education according to SDGs can be achieved through ICT as it breaks the geographical or time barriers to accessing education (NEP, 2020). The United Nations strongly believes that the quality of education can be improved through international cooperation, adequate infrastructure, and advanced investment to improve education for all developing countries. Furthermore, the UN support a sense of international cooperation like sharing and exchanging educational knowledge and partnerships, funding scholarships and fellowships to achieve education goals which are possible with the help of information and communication technologies (United Nations, 2012).

The NEP 2020 stands for ICT integration in education, where learning becomes more flexible and develops high order of thinking and problem-solving skills. Students develop skills such as presentation, teamwork and collaboration, and other academic relating things with the help of ICT. It also enhances the students to attain a higher order of thinking, evaluation, and develop creative thinking. It leads students not only in academic growth but also to know how to solve real-life daily today's problems (Vidanagama & Karunathilake, 2021). Furthermore, interactive technologies such as interactive whiteboards help learners easily acquire knowledge and understand the concepts better, and thus teaching-learning becomes effective and productive. Additionally, social media motivates and supports students and teachers to adopt the learning environment in the most effective approach and maintain better community relations (Akilbekovna, 2021; Papademetriou et al., 2022). However, teaching in the present schools requires knowledgeable and skilful teachers in using computers and other technology tools (Sunanda, 2015). To take full advantage of ICT in education, proper training of teachers and guidance programs are required. Moreover, it is the responsibility of the government to take the initiatives to fix the existing problem by providing regular in-service training programs and providing sufficient school infrastructure with robust connectivity (Fengchun & Wayne, 2021; Muthuprasad et al., 2021; Parida & Rout, 2021).

It made the students and teachers become problem-solvers, critical thinkers, and creative. However, ICT in education in India is concentrated only in metropolitan cities, so there is a need to access ICT both in rural and urban to achieve the educational goal. Therefore, the government, the policymakers, and the administration play a significant part while integrating ICT into education. Of course, there will be disadvantages when there are any innovations. However, the importance of ICT for quality education cannot be denied. Lack of proper ICT policy and inadequate funds for the development of ICT in education, non-availability of ICT infrastructures, lack of ICT training and professional development, lack of technical support, low internet speed, frequent power cuts, lack of ICT knowledge, skills, literacy of teachers and rigid attitude of teachers are the hinders for the successful application of ICT in education. Having the infrastructures or facilities alone cannot bring the best result, but it has to check what is best suited and effectively used. Additionally, regular in-service teacher training is required to update ICT knowledge and use it in teaching. Even though we are in the 21st century, known as the era of technology, the computer literacy rate of India is only 6%. The democratisation of education is possible only when the applications of ICT are ensured to their optimum level (Das, 2020). Therefore, the government should provide sufficient ICT facilities and resources in rural and urban areas. Moreover, ICT training is vital to know how to incorporate technology to meet the needs of the students (Mukti et al., 2020). So, it is necessary to have a good relationship and understanding between Principals, teachers and stakeholders for the fruitful integration of ICT in schools (Vidanagama & Karunathilake, 2021).

The outbreak of the Covid-19 pandemic obliged the world to use ICT predominantly in the teaching-learning process to a great extent to continue the learning process despite the closure of schools, colleges, and universities. The adoption of ICT in learning environment shifts the traditional to student-centred methods, where students play a central role while teachers act as a guide or facilitators. This method moved from lectures to group activities, discussion, and activities (Sobaih et al., 2022). For synchronous online and hybrid mode of learning uses platforms like google meet, MS Teams, Webex, zoom and so on became popular in India to continue the learning process despite the closure of educational institutions. The use of these platforms continues even today.

Conclusion

The need for an hour is to have a quality in education particular in India where 25% of the educated youth are unemployed (A. N. Sharma, 2022). Through quality education, an individual would be able to find a suitable job through their skills and competencies in certain field. Therefore, integrating information and communication technology in education is highly required to achieve the quality education goal and improve the quality of education. Teachers are the agents to bring changes in the teaching-learning environment only when there is an availability of infrastructures, skills and positive attitudes towards using ICT in teaching. Therefore, ICT training for teachers is highly required to adapt successfully to this technological world, particularly in education. However, the government, the policymakers, and the stakeholders play a vital role in the successful and effective integration of ICT in education to improve education quality.

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